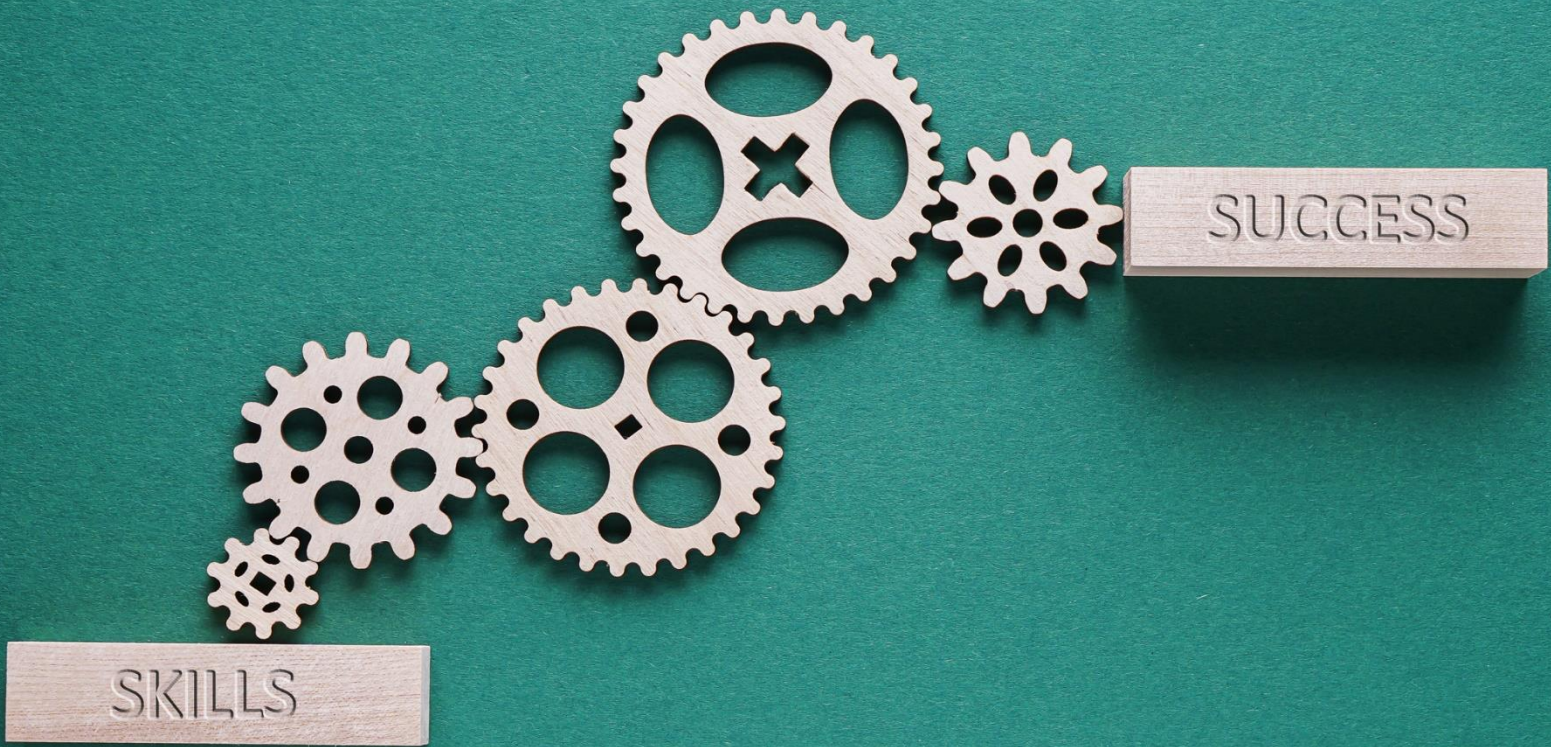




Final Report

Phase II Evaluation of Roca's CBT Curriculum



May 31, 2021

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Executive Summary

Roca, Inc. is a non-profit organization serving high-risk young men and mothers, ages 17-24, with sites in Chelsea, Springfield, Holyoke, Boston, and Lynn Massachusetts, as well as in Baltimore, Maryland. Recently, and in partnership with the Community Psychiatry Program for Research in Implementation and Dissemination of Evidence-Based Treatments (PRIDE) at Massachusetts General Hospital (MGH), Roca created and implemented a formal and informal curriculum, called Re-Wire, based on the tenets of cognitive behavioral theory (CBT). The Re-Wire curriculum was originally developed in 2015 but was modified after a pilot implementation to better align with Roca's model and participant needs; the modified Re-Wire curriculum was implemented in 2018. In this report, we provide results from our three-year fidelity and impact evaluation of Roca's modified Re-Wire curriculum.

The period of performance for this evaluation is June 1, 2018 to May 31, 2021. This period includes the coronavirus (COVID-19) pandemic and resultant shut-down of non-essential activity which began around March 15, 2020. The communities that Roca serves have been among the hardest hit by the pandemic. Throughout this report, when applicable, we discuss the impact of the COVID-19 pandemic on Roca's CBT curriculum, Roca's participants, and our evaluation.

Research Questions

The primary research questions (RQs) this evaluation addresses are:

1. What is the degree to which CBT is being implemented by Roca Youth Workers and staff?
2. To what degree is the CBT curriculum being implemented as designed?
3. What is the impact of CBT on intended participant outcomes:
 - a. Program engagement?
 - b. Unsubsidized employment?
 - c. Recidivism, including arrests, convictions, and charge severity?

Data Sources

Roca's CBT curriculum has been designed and tailored to fit the needs of Roca participants, as well as the overall Roca model. We designed the fidelity assessment to address RQ1 and RQ2 through on-site observations of CBT programming for young men at the Roca sites in Chelsea, MA, Boston, MA, Springfield, MA, and Baltimore, MD¹ and informal interviews with Roca staff while on site. All observations were completed in 2019. We also conducted descriptive analyses of programming data using Roca's Efforts to Outcomes (ETO)² performance management program data. To answer RQ3, we conducted descriptive and quasi-experimental statistical analyses using Roca's ETO performance management program data and Criminal Offender Record Information (CORI) data provided by the Massachusetts Department of Criminal Justice Information Services (DCJIS) and data from the Maryland Department of Public Safety and Correctional Services (DPSCS). To inform all three RQs from the perspective of Roca's participants, we also descriptively analyzed self-reported data from a Roca participant survey we conducted in the fall of 2020.

¹ Participants in Roca's Central American and young mothers programs and at the Lynn, MA site were not included in the scope of this evaluation. We did not conduct an on-site observation of the Holyoke site.

² Efforts to Outcomes (ETO) is a flexible and customizable performance management software, hosted by Social Solutions.

Overview of Key Findings

Fidelity Assessment (RQ1 & RQ2)

Our assessment of fidelity to the CBT curriculum as designed for Roca was framed by the “What does delivering CBT at Roca look like?” section of the Re-Wire CBT Skills Manual Introduction:

Formal Practice:

1. Establishing rapport with the individual.
2. Checking in on emotional and behavioral experiences in the past week (tracked weekly).
3. Checking in on problems that may have come up in the past week that the individual wants to focus on in class.
4. Review of skills practice in the past week.
5. Or, identifying a recent situation where the individual wished they had used a skill.
6. Teaching (or reviewing) a new skill.
7. Assign skill to practice over the next week.

Informal Practice:

1. Modeling of CBT skills, fostering a therapeutic environment.
2. Daily interactions with young people are goal-oriented.
3. Capitalizing on “teaching moments.”

Degree of CBT Implementation

- Roca participants received an average of 1.24 CBT-related Youth Worker contacts per month and attended an average of 1.03 CBT-related programs. Of Youth Worker contacts that contained CBT, conversational CBT was the most common type documented (0.74/month) followed by informal with visuals (0.41/month) and then formal (0.18/month). Almost a quarter of all Youth Worker contacts and programming documented in ETO involved CBT.
- CBT engagement varied substantially by site. Participants in Boston received more CBT-related Youth Worker contacts than participants at other sites, with an average of 2.0 CBT contacts per month at the Boston site compared to 0.64 per month at the Chelsea site. Young men at the Baltimore and Springfield sites more frequently attended CBT programming than those at the Boston and Chelsea sites. Boston and Baltimore had the highest average monthly occurrences of CBT training and the highest rates of Roca activities that included CBT. However, training for participants in Baltimore incorporated the least number of CBT skills of all the sites.
- Skills 1 (Be Present), 4 (Act On Your Values), and 5 (Stick With It) were the most commonly practiced skills during both types of engagement. Skill 7 (Solve It) was the least practiced skill during both Youth Worker contacts and programming. All skills are slightly more likely to be practiced during Youth Worker contacts than programming.
- Roca participants with higher number of arrests were more likely to review fewer CBT skills during their time at Roca. Participants with a prior history of drug use or sales was associated with a higher rate of CBT programming over all programming.

- Overall, Roca participants who received housing assistance, healthcare assistance, food assistance, welfare, or other public assistance were more likely to review a higher number of CBT skills during their time at Roca. For Roca participants receiving welfare, this trend persisted across other measures of CBT engagement. Receiving welfare was also associated with a higher monthly rate of Youth Worker CBT contacts and a higher monthly rate of CBT program attendance.
- Roca participants who were younger at eligibility had a slightly lower rate of CBT programming over all programming. Participants with a high school degree or GED had a slightly higher rate of CBT programming over all programming.

Implementation of and Fidelity to Formal Practice of CBT

- We observed high levels of fidelity to the formal components of CBT as outlined in the skills manual:
 1. **Establishing rapport with the individual.** Establishing rapport is embedded throughout Roca’s model and foundational to their overall approach.
 2. **Checking in on emotional and behavioral experiences in the past week (tracked weekly).** Checking in with young men about current and past experiences is also embedded in the Roca model and often captured during Relentless Outreach and when building Transformational Relationships.
 3. **Checking in on problems that may have come up in the past week that the individual wants to focus on in class.** Staff consistently identified a focus of class, but not necessarily specific to problems experienced by young men in the past week. In fact, staff often used current experiences as the focus of class. When doing so, Roca participants were observed to be more engaged in comparison to when the examples provided by the formal materials (skills manual, PowerPoint) were used.
 4. **Review of skills practiced in the past week.** During our observations, past skills were reviewed, but not specifically those taught in the past week. It may be difficult to review the specific skills taught the previous week since the young men often take different classes from each other.
 5. **Or, identifying a recent situation where the individual wished they had used a skill.** Youth Workers were observed identifying a recent situation where the individual wish they used a skill when it was difficult for the Roca participant to come up with a focus for class.
 6. **Teaching (or reviewing) a new skill.** Teaching or reviewing a new skill was the most consistently observed focus of formal CBT practice. Staff often selected the skill to teach or review based on its application to a current situation. The skills we observed most often were “Be Present” and “Act on Your Values”.
 7. **Assign skill to practice over the next week.** We often observed staff assigning specific tasks related to a skill.
- We did observe some variation in how the formal practice of CBT was implemented, including the format of the CBT lesson (e.g., individual or group setting; location), the staff person conducting a formal CBT lesson (e.g., availability, comfort and competency with the material), the time spent delivering a formal lesson (impacted by participant engagement and availability), and the mode of administration of the lesson material (e.g., worksheets, skill cards, PowerPoint slides).

Implementation of and Fidelity to Informal Practice of CBT

- During our observations we also frequently observed informal components of CBT being implemented across sites following the structure detailed in the skills manual:
 1. **Modeling of CBT skills.** CBT was often observed to be infused naturally in conversation. Staff stressed that they need to figure out what CBT skills they can use themselves to help them use the skills with the young men. During our observations, staff often discussed skills they had been working on themselves with other staff members. Staff were also often observed enforcing the language of CBT with the young men, such as discussing a cycle the staff was currently in. One staff member stated, “If we don’t break our own cycle, we won’t be able to break their cycle.”
 2. **Fostering a therapeutic environment.** Fostering a therapeutic environment is foundational to Roca’s model and was a component of the model prior to the introduction of CBT. Staff were often observed fostering a therapeutic environment in various aspects of programming and conversations. Fostering a therapeutic environment and remaining non-judgmental created a positive and welcoming environment that enabled young men to feel comfortable opening-up about what was happening in their lives.
 3. **Daily interactions with young people are goal-oriented.** We observed many interactions with young men that were goal-oriented, however this did not necessarily occur daily because frequency depended on to the number of contacts made with the specific young man (i.e., Youth Workers did not necessarily interact with the young men on their caseloads on a daily basis). Goal setting was often infused into conversations when Youth Workers were discussing skills with the young men. For example, one Youth Worker asked a young man how he could “stick with” going to school and they set the goal to go to bed earlier.
 4. **Capitalizing on “teaching moments.”** The ability for staff to capitalize on “teaching moments” was facilitated when a therapeutic environment had been established. Staff members were observed to be presented with opportunities to tie in a CBT skill or reinforce CBT language (e.g., cycles, think-feel-do) when the young men felt comfortable opening-up about what was happening in their lives. Additionally, staff who were well versed in the CBT curriculum were able to naturally infuse CBT into conversations which allowed them to capitalize on teaching moments.

Self-Reported Participant Use of and Satisfaction with CBT

- More than three quarters of respondents (76%) stated that they had ever done CBT skills with Roca. The most commonly discussed skills were Be Present (77%), Flex Your Thinking (77%), and Act On Your Values (76%), followed by Label Your Feelings (72%), Stick With It (66%), Solve It (63%), and Move It (62%).
- Overall, respondents indicated that they were very satisfied with the CBT skills: on a scale from 1 to 5, with 5 being the highest rating, each of the seven skills received an average rating of at least 4. The Flex Your Thinking skill was highest rated (4.29), followed by Act On Your Values (4.24), Solve It (4.23), and Stick With It (4.22). There was a significant difference by site for Act On Your Values ($p < .05$) such that Boston respondents rated the skill lower than respondents from other sites.

Impact Analysis (RQ3)*Primary Analysis: Descriptive Dosage Analysis*

- Early CBT was strongly related to later engagement with Roca and higher probabilities of employment and was related to lower probability of later arrest.

- For each additional monthly CBT Youth Worker contact in the first three months of engagement with Roca, participants attended an average of 0.97 more programs per month after those first three months.
- Increases in the number of different CBT skills reviewed increased the probability of both TEP and unsubsidized employment. Increased monthly CBT programming attendance increased the probability of TEP but decreased the probability of unsubsidized employment.
- Increased monthly CBT programming attendance decreased the probability of an arrest for any offense.
- After controlling for Roca participant characteristics, these relationships remained the same, except early Monthly CBT Youth Worker contact had a positive effect on TEP.
- The effect of greater levels of CBT was relatively consistent across Roca participant characteristics, with only a few factors that showed a significant interaction effect:
 - Past trauma had inconsistent effects on the impact of CBT.
 - Current drug use or sales and having a high school degree or equivalent increased the effectiveness of CBT.
 - Gang membership and being a parent or an expectant parent reduced the effectiveness of CBT.

Secondary Analysis: Quasi-Experimental Dosage Analysis

- Again, the most notable impact of early CBT at Roca is on later engagement with Roca's overall programming.
 - Roca participants who received more than 5 CBT skills in their first three months a Roca, have a 26% higher contact success rate during later months when compared to Roca participants who receive fewer CBT skills.
 - Roca participants who received an above average level of monthly CBT Youth Worker contacts in their first three months attended 3.75 more classes per month in later months than participants who received fewer CBT contacts.
- CBT also had an impact on TEP.
 - For TEP enrollment, the number of CBT skills and meeting CBT guidelines standards both increased the probability of obtaining enrollment in TEP.
- Receipt of CBT that met at least one measure of Roca high dosage guidelines (i.e., CBT contacts of 8 or greater per month, CBT programming of 4 or greater per month, and receipt of all 7 skills) was linked to a reduced time to TEP enrollment.
- We did not find an effect of CBT on any of the recidivism measures. It is possible that with a larger sample or longer follow up window, significant relationships between CBT and arrests may have been observed.

Impact of CBT on Participant Outcomes - Survey Sample

- Of the respondents who said they had learned about any of the CBT skills at Roca, 86% stated that they felt ready to use them.

- There was a significant difference by site ($p < .05$) such that respondents from Boston were less likely to say they felt ready to use the skills (69%) than respondents from other sites (87% in Chelsea, 91% in Springfield, and 90% in Baltimore).
- Of those who said they were not ready to use the skills in their everyday lives or were not sure that they were ready, 51% said they needed more practice using the skills first.
- Of respondents who said they felt ready to use the skills, 84% reported that they had tried using them in their life outside of Roca.
 - Act On Your Values was the most commonly used skill (reported by 66% of respondents), followed by Be Present (64%) and Flex Your Thinking (64%).
 - Use of Move It and Act On Your Values differed significantly by site ($p < .01$) such that a smaller proportion of respondents from Boston reported using that skill than respondents from other sites, particularly Baltimore.
- When respondents were asked to select among various situations for which they had used the skills to cope, violence was the most commonly selected situation (67%), followed by relationship problems (59%), job loss (50%), educational setbacks (38%), the COVID-19 pandemic (35%), and childcare issues (23%).
 - Childcare issues were significantly ($p < .05$) more frequently indicated among respondents in Boston (30%) and Baltimore (32%) than in Chelsea (13%) and Springfield (17%).
- There was a negative association between the frequency of engagement with CBT and thinking about doing something against the law since coming to Roca; in other words, respondents who reported thinking *more* about doing something against the law before coming to Roca did CBT *less* often. This finding was true in the base model ($p < .01$), the model that included site and eligibility date as covariates ($p < .05$) and in the full model (i.e., the one with all of the covariates included; $p < .05$).
- Respondents who had ever tried CBT were more likely to say they did something against the law *less* since engaging with Roca. This finding was true in the base model ($p < .001$), the model that included site and eligibility date ($p < .01$), and the full model ($p < .01$).
- Respondents who engaged with CBT more frequently were also more likely than those who had never tried CBT to use drugs less often since coming to Roca; this association was significant only in the full model ($p < .05$).

The impact of COVID-19

- COVID-19 has affected Roca's programming, the economy, and the justice system. Despite the disruption caused by the pandemic, it does not change our general findings because it represents such a small portion of the overall timeframe for this evaluation.

CONTENTS

- 1. Overview**
 - 1.1 Research Questions
 - 1.2 Data Sources
 - 1.3 Human Subjects Review
 - 2. Methods and Analysis**
 - 2.1 Methods
 - 2.1.1 On-Site Observations
 - 2.1.2 Administrative Data
 - 2.1.3 Participant Survey
 - 2.2 Analysis
 - 2.2.1 Fidelity Assessment
 - 2.2.2 Impact Analysis
 - 3. Findings**
 - 3.1 Roca's CBT Curriculum
 - 3.2 Implementation of and Fidelity to CBT Curriculum
 - 3.2.1 Degree of CBT Implementation
 - 3.2.2 Implementation of and Fidelity to Formal Practice of CBT
 - 3.2.3 Implementation of and Fidelity to Informal Practice of CBT
 - 3.2.4 Self-Reported Participant Use of and Satisfaction with CBT
 - 3.3 Impact of CBT on Participant Outcomes
 - 3.3.1 Primary Analysis: Descriptive Dosage Analysis
 - 3.3.2 Secondary Analysis: Quasi-Experimental Dosage Analysis
 - 3.3.3 Impact of CBT on Participant Outcomes - Survey Sample
 - 4. Discussion**
 - 4.1 Summary of Key Findings
 - 4.1.1 Fidelity Assessment (RQ1 & RQ2)
 - 4.1.2 Impact Analysis (RQ3)
 - 4.1.3 The impact of COVID-19
 - 4.2 Limitations
 - 4.3 Recommendations and Future Directions
- Appendix A. Data Collection Protocols**
- A.1 Formal and Informal CBT Observation Protocols
 - A.1.1 Roca Formal CBT Implementation Observation Protocol
 - A.1.2 Roca Informal CBT Implementation Observation Protocol
 - A.2 Roca Participant Survey
- Appendix B. Codebook**
- Appendix C. Additional Tables**

1. Overview

Roca, Inc. is a non-profit organization serving high-risk young men and mothers, ages 17-24, with sites in Chelsea, Springfield, Holyoke, Boston, and Lynn Massachusetts, as well as in Baltimore, Maryland. Recently, and in partnership with the Community Psychiatry Program for Research in Implementation and Dissemination of Evidence-Based Treatments (PRIDE) at Massachusetts General Hospital (MGH), Roca created and implemented a formal and informal curriculum, called Re-Wire, based on the tenets of cognitive behavioral theory (CBT). The Re-Wire curriculum was originally developed in 2015 but was modified after a pilot implementation to better align with Roca's model and participant needs; the modified Re-Wire curriculum was implemented in 2018. In this report, we provide results from our three-year fidelity and impact evaluation of Roca's modified Re-Wire curriculum.

The period of performance for this evaluation is June 1, 2018 to May 31, 2021. This period includes the coronavirus (COVID-19) pandemic and resultant shut-down of non-essential activity which began around March 15, 2020. The communities that Roca serves have been among the hardest hit by the pandemic. Throughout this report, when applicable, we discuss the impact of the COVID-19 pandemic on Roca's CBT curriculum, Roca's participants, and our evaluation.

1.1 Research Questions

The set of research questions (RQs) that this evaluation addresses include:

2. What is the degree to which CBT is being implemented by Roca Youth Workers and staff?
3. To what degree is the CBT curriculum being implemented as designed?
4. What is the impact of CBT on the following intended participant outcomes:
 - a. Program engagement?
 - b. Unsubsidized employment?
 - c. Recidivism, including arrests, convictions, and charge severity?

1.2 Data Sources

Roca's CBT curriculum has been designed and tailored to fit the needs of Roca participants, as well as the overall Roca model. We designed the fidelity assessment to address RQ1 and RQ2 through on-site observations of CBT programming for young men at the Roca sites in Chelsea, MA, Boston, MA, Springfield, MA, and Baltimore, MD³ and informal interviews with Roca staff while on site. All observations were completed in 2019. To answer RQ3, we conducted statistical analyses using Roca's Efforts to Outcomes (ETO)⁴ performance management program data and Criminal Offender Record Information (CORI) data provided by the Massachusetts Department of Criminal Justice Information Services (DCJIS) and data from the Maryland Department of Public Safety and Correctional Services (DPSCS). To inform all three RQs from the perspective of Roca's participants, we also analyzed self-reported data from a Roca participant survey we conducted in the fall of 2020.

1.3 Human Subjects Review

Plans and protocols for all data collection and analysis were reviewed and approved by the Abt Institutional Review Board.

³ Participants in Roca's Central American and young mothers programs and at the Lynn, MA site were not included in the scope of this evaluation. We did not conduct an on-site observation of the Holyoke site.

⁴ Efforts to Outcomes (ETO) is a flexible and customizable performance management software, hosted by Social Solutions.

2. Methods and Analysis

The purpose of this evaluation is to describe the implementation of and fidelity to Roca's Re-Wire curriculum as intended. In addition, we evaluated the impact of the CBT curriculum on various participant outcomes and how fidelity to the curriculum may provide context for understanding those findings. We also assessed CBT fidelity and impact from the perspective of Roca participants.

2.1 Methods

2.1.1 On-Site Observations

An Abt team member⁵ conducted multi-day observations at Roca located in Baltimore, Maryland and three Massachusetts locations: Chelsea, Springfield, and Boston. The observations consisted of shadowing Roca Youth Workers during their daily activities, including street outreach to young men and partner agencies, all scheduled on- and off-site programming for the days we observed⁶, drop-in programming, and ad hoc participant and staff activity and interactions on the streets and in the buildings. During the observation period, the observer used structured observation protocols, developed from the Re-Wire skills manual, to document CBT-related activities relevant for answering our research questions (see Appendix A). The protocols also included conversational questions that the observer used to informally interview staff about Roca's CBT curriculum during the period of observation, such as when driving between contacts or when waiting for programming to start.

2.1.2 Administrative Data

We collected Roca's ETO program data, Massachusetts CORI data, and Maryland DPSCS data for our sample of Roca participants. In service of Roca's commitment to data-driven performance management, ETO data are designed with administrative, rather than analytical purposes in mind; thus, the data require substantial restructuring to create files that can be used for analytic purposes. The same is true for CORI and DPSCS data. In the following subsections, we describe the process for creating an analytic file using the ETO, CORI, and DPSCS data.

2.1.2.1 Data Extraction and Matching

2.1.2.1.1 ETO Data

Data were extracted from ETO using a series of nine reports created by the Roca Director of Evaluation and Learning, Sotun Krouch: data collected at the time of referral; data collected at the time of intake; information on program enrollment; information on Youth Worker contacts with young men; information on participant program attendance; needs assessments; life event checklists; certifications obtained by Roca participants; and records of unsubsidized employment. While the unit of observation for some reports is the individual participant (e.g., referral is only filled out once for each person), some reports contain multiple observations per person. For example, the current program attendance form contains over 1,000 observations for some individuals, with one individual possessing 1,469 instances of a program attendance record. Simply combining these files would lead to a data set with numerous observations for each Roca participant, making any analyses of Roca participants difficult and misleading. As such, these data needed to be restructured for our analyses.

⁵ Although two team members were on-site for each observation, only one of them was focused on observations for this evaluation; the other team member was focused on observations related to the concurrent implementation evaluation of Roca.

⁶ Weekly programming at each site is flexible and dependent on participants' programming needs and staff availability. When scheduling our observations, we coordinated with each site's director to ensure that we were able to observe a variety of programming offered at the site.

2.1.2.1.2 CORI Data

CORI data were extracted through a four-step process. First, Abt analysts pulled a sample of names and dates of birth from the ETO data, including a main file and multiple files with different iterations of names for individuals with more than one last name. For example, John Jackson-Johnson would include three separate iterations: John Jackson-Johnson, John Jackson, and John Johnson. Second, we submitted these files to the Roca Director of Evaluation and Learning who then submitted them to DCJIS on Abt's behalf. Third, DCJIS matched these files to any name within their database, returned it Roca, and Roca returned it to Abt. Fourth, Abt analysts programmatically matched the returned data to the ETO data. Because matching occurred on imprecise data strings such as first and last name, DCJIS often returned close but not identical matches; in cases where multiple individuals represented a close but not identical match, DCJIS returned all possible matches. The matching program we used first attempted to perfectly match cases (e.g., matching on identical string). For example, here, "John Jackson-Johnson" may be matched to "John Jackson-Johnson." This matching is tried using variations on an individual's first, middle, and last names. For cases in which no perfect match existed, the program then attempted a similar series of matches using fuzzy matching (e.g., matching on similar but not identical strings). For example, here, if "John Jackson-Johnson" could not be matched in the perfect matching stage, he may be matched to "Jonathan Jackson Johnson" at this stage. Fuzzy matching was accomplished using generalized edit distance (the COMPGED function in SAS), which measures the dissimilarity between two strings, accounting for the number of deletions, insertions of replacements required to make two string identical. The closest matches (those with the lowest generalized edit distance) are the records that were linked.

2.1.2.1.3 DPSCS Data

DPSCS data was obtained through two sources: a primary contact at DPSCS that provided all incarceration information for our sample of individuals and a contact at the Criminal Justice Information Services (CJIS) section of DPSCS which provided all court data with arrest and conviction information. Both agencies matched primarily on the State Identification Number (SID), a number assigned to anyone who is arrested or has a criminal history in Maryland through some other means. Roca provided us with this information for all Baltimore participants with an SID, and Abt provided a list of SIDs to both agencies for the participants in our sample. DPSCS then returned matched criminal history information to Abt. In the case of individuals without an SID, Abt provided both DPSCS contacts with that individual's name and date of birth, and the agencies attempt to match on these features. This information was then used to update Abt's SID record and all matches were conducted using the SID. Fuzzy matching procedures akin to those used with CORI data are not necessary for DPSCS data because SIDs are unique to each individual and unambiguous. Thus, perfect matching captures all cases.

2.1.2.2 Data Restructuring

2.1.2.2.1 ETO Data

The process of restructuring the ETO data involved transforming each piece of data into a wide file wherein each observation represented an individual rather than a program record. In this format, each of the program attendance records for each person, for example, were now listed as variables for that individual. Once all data were in a wide format, they were then combined into a single data set in which each observation represented a person, and all information on that person was contained within numerous variables.

2.1.2.2.2 CORI Data

To restructure the CORI data, three variables needed to be parsed to obtain the information associated with each observation which represented an arraignment for a single offense. The variable "disp" contained all conviction and sentence information. The information was contained in an inconsistently recorded and ordered string that required hundreds of lines of code to parse. Next, the variables "offenseliteral" and "offensedesc" needed to be parsed to determine the offense for which an individual was being arraigned. Finally, as with the ETO data, these data were made wide so that each observation represented a person, and all arraignment information was contained within numerous variables.

2.1.2.2.3 DPSCS Data

To restructure the DPSCS data, the DPSCS and CJIS data sets were processed separately. For the DPSCS main file, data was provided for sentenced individuals incarcerated in Maryland and unsentenced individuals incarcerated in Baltimore. Commitment dates were clearly specified by a unique variable, and the “off_literal” variable was used to determine offense type. For CJIS data, arrest and court dates were provided by unique variables, and disposition was determined using the “ver_dispo” variable along with variables that classify the length of each sentence type (incarceration, supervision, suspended). The “off_literal” variable was used to determine the offenses associated with each charge. The DPSCS main file and CJIS file were then merged. Where applicable, discrepancies between the two files were checked, and any issues were addressed through discussions with the data providers. Finally, as with ETO and CORI, data were made wide so that each observation represented a person.

2.1.2.3 Terms of Active Engagement

One challenge for summarizing activity at Roca is that the model is designed to allow for periods of disengagement and Roca rarely officially ends an individual’s active involvement with Roca. As a result, programming end dates that are captured in ETO could not be relied upon as clear indicators of disengagement with Roca for evaluation purposes. However, for this evaluation, we needed to determine an “end date” for each individual in order to assess how long individuals remain involved with Roca and to construct rates of activity. To determine each individual’s end date, we used participant and Youth Worker recorded activity to construct terms of activity or active engagement with Roca (hereafter, terms). We started terms with the first instance of activity documented in intake dates, certification dates, enrollment dates, or Youth Worker activities, and ended it only when no activity had been recorded for an entire month⁷. Roca’s operating procedures call for Youth Workers to make two actual contacts or four attempted contacts per week with young men on their caseloads. Based on this target, if Roca considers an individual to still be actively involved with Roca, it is highly unlikely they would have no contacts recorded for an entire month. Even if that individual has disengaged from Roca, their Youth Worker should still be regularly attempting to reach them, and these attempts would be recorded in ETO. If activity resumes after the determined end date (i.e., the young man becomes re-engaged), a new term will begin with a new start and end date. For this evaluation, the final sets of data were extracted on December 20, 2020. Any individuals who were still actively involved with Roca on that date (and thus did not have a recorded program end date) had their end dates set to December 20, 2020. The selection of this date allowed for the construction of engagement rates by providing the underlying time spent at Roca and the quantification of the time spent with Roca across terms.

2.1.2.4 Final Sample

The data used for this report were edited to create a sample best aligned with the scope of the project. The sample only includes Roca participants from the Roca sites included in study (i.e., Chelsea, Baltimore, Boston, and Springfield). Because the current version of the CBT curriculum was fully implemented in September of 2018, this date was used as a cut off. For the fidelity measures, all individuals who were active at Roca after September 1, 2018 were included in analysis (determined by the lack of an End Date recorded in ETO before that September 1, 2018). For all outcomes analyses, only individuals who became eligible after the start of CBT (determined by an Eligibility Date recorded in ETO after September 1, 2018) and have over three months of activity at Roca were included. CORI and DPSCS data were obtained on December 20, 2020, and thus these data were used as the final date for all analyses. Any Roca activity that occurred after this date was not captured. All young men who were not deemed eligible for Roca were also not included in analyses. Finally, because the focus of this study is on the young men’s program, we exclude female participants (i.e., young mothers). In agreement with Roca, we also exclude

⁷ Using one month as the cut-off to define disengagement was determined in collaboration with Roca leadership.

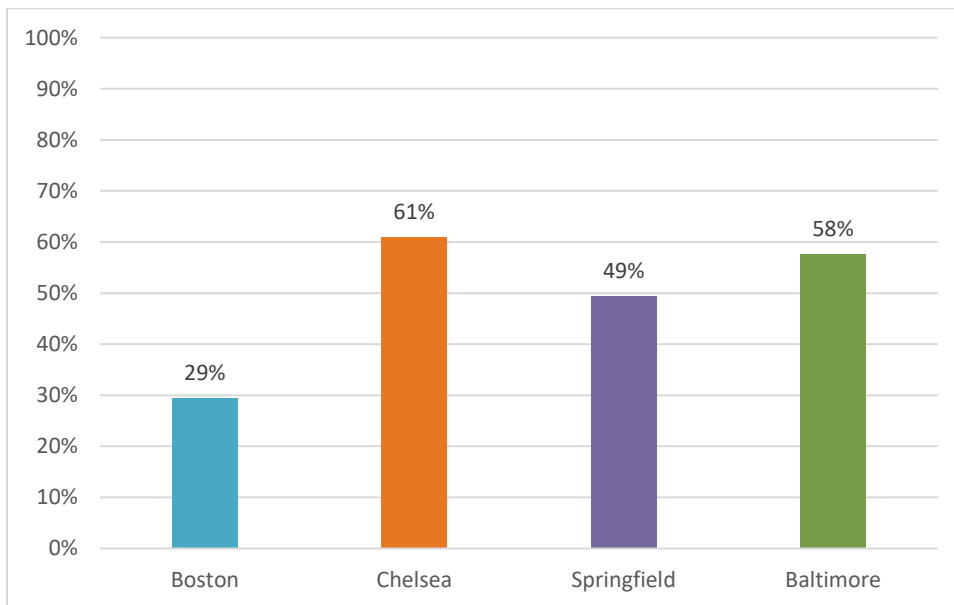
participants at Roca with a funding slot linked to the programming for the Central American Youth Initiative (i.e., CHS and DPH TPP).

2.1.3 Participant Survey

Our evaluation included a web-based survey of a sample of 642 active Roca participants at each site included in the study⁸. We developed the survey (see Appendix A) and programmed it into ConfirmIT, an online survey software that allows access on a computer, tablet, or mobile phone⁹. For young men in our sample with a valid email address, Abt sent an email with a unique link to the survey; for all others in the sample, Roca coordinators at each site sent text messages with a survey link. Upon opening the survey link, respondents were asked to read a consent statement and indicate that they had read it by clicking through to the beginning of the survey. Designated Roca coordinators were available to help respondents with any questions or challenges they had in accessing or completing the survey. The recruitment, survey, and consent material were made available in English and Spanish.

The survey administration period began on September 21st, 2020 and ended on December 31st, 2020. A total of 310 Roca participants completed the survey. Nine Roca participants did not consent to taking the survey; these individuals were not included in the final sample of 310. The overall response rate was 49%. Exhibit 2.1-1 presents response rates for each site.

Exhibit 2.1-1. Participant Survey Response Rate by Site



Of all respondents, 32% indicated that they were based at the Baltimore site, followed by 26% each from Chelsea and Springfield; 16% of the sample indicated that they received services from the Boston site+

⁸ We also administered the survey to participants in Roca-Lynn and Roca-Holyoke; however, per the terms of this contract, we do not include the Lynn or Holyoke samples in our survey analyses. We did not survey participants in the Central American or young mothers programs.

⁹ In instances where participants did not have access to an electronic device to take the survey, Roca coordinated with them to provide access via Roca-owned tablets or computers. Abt was not involved in this process.

2.2 Analysis

2.2.1 Fidelity Assessment

2.2.1.1 Observation Data

Daily notes taken during and after site observations as well as overall site observation summaries were entered into NVivo, a qualitative analysis software tool, for coding and analysis. Two Abt team members created a codebook (see Appendix B) a priori from the RQs and observation guides. Additional codes were defined and added to the codebook as major themes were identified during the coding process. Queries were then run in NVivo to identify relationships between the codes and coded material was reviewed to assess fidelity in the implementation of CBT. The two Abt team members worked together throughout the codebook development and analysis processes to ensure consistency across the application of codes and interpretation of findings. We did not use a structured intercoder reliability process.

2.2.1.2 ETO Data

Analyses of fidelity using the ETO data involved two types of analysis. First, we conducted univariate analyses that illustrated the use of CBT overall and across sites. We examined use of CBT by Youth Workers, use of CBT in formal programming, combined CBT use across these modes, and use by CBT skill type. Collectively, these analyses provided a sense of how much CBT is being used within Roca and how the use of CBT varies by site and type of CBT (e.g., formal or informal, which skill). We used basic descriptive statistics and graphs to highlight the means, standard deviations, and proportions for a variety of CBT measures. Second, we used multivariate analyses to examine which characteristics at the start of Roca are associated with higher or lower levels of CBT dosage. We used regression models that regressed level of CBT as measured across five different forms of CBT on a variety of demographic and criminal history variables while controlling for Roca site and indicator of whether an individual became eligible during the COVID-19 pandemic timeframe, was active during the COVID-19 pandemic timeframe, or neither. These analyses used the larger sample and encompassed all individuals with any activity at Roca following the start of CBT on September 1, 2018 (N=1,036).

2.2.1.3 Survey Data

Fidelity analyses of the survey data were modeled after the ETO program data analyses. Basic descriptive analyses were conducted first to describe the survey sample in terms of demographics, as well as participant engagement and satisfaction with CBT. Descriptive statistics were examined overall and by Roca site. Because the timeframe for the survey administration encompasses the onset of the COVID-19 pandemic¹⁰, we also examined descriptive statistics by eligibility date prior to and after the onset of the COVID-19 pandemic. One-way ANOVAS and chi-squared tests were used to test significance across site and by eligibility before and after COVID-19.

Table 2.2.1-1 presents the characteristics of the Roca participants who responded to the survey. On average, respondents were 21 years old at eligibility (SD=2.45); there were no significant differences in age at eligibility by site. Fifty-five percent of respondents identified as Black or African American; 37% as Hispanic or Latino, 4% as Bi- or Multi-racial, 3% as White, and 2% as another race or ethnicity. There were significant racial/ethnic differences by site ($p < .001$), with Boston and Baltimore having majority-Black/African American samples and Chelsea and Springfield with majority-Hispanic/Latino samples. There were no significant differences between the pre-COVID-19 and during COVID-19 samples.

In terms of how respondents reported they got engaged with Roca, 44% were referred, 18% were invited to engage by a Youth Worker, 17% were mandated by a judge, 15% were walk-ins, and 6% engaged another way. There was a significant difference in engagement type by site ($p < .01$) such that respondents

¹⁰ In collaboration with Roca leadership, we determined that March 15, 2020 would serve as the indicator for the onset of COVID-19 since this is the approximate date that shutdowns related to the pandemic began.

SECTION 2: METHODS AND ANALYSIS

from Springfield were much less likely than the other sites to be mandated by a judge or to get invited by a Youth Worker and were much more likely to walk in.

Table 2.2.1-1 Survey Respondent Characteristics

Variable	Overall Mean (SD)/ Percent	Boston Mean (SD)/ Percent	Chelsea Mean (SD)/ Percent	Springfield Mean (SD)/ Percent	Baltimore Mean (SD)/ Percent
<i>Age</i>	20.82 (2.45)	20.12 (2.71)	20.20 (2.47)	20.79 (2.24)	20.36 (2.03)
<i>Race/Ethnicity</i>					
<i>Black/African American</i>	54.77%	80.95%	19.18%	35.37%	96.88%
<i>Hispanic/Latino</i>	36.83%	14.29%	54.79%	56.10%	2.08%
<i>Bi/multi-racial</i>	3.57%	4.76%	5.48%	3.66%	1.04%
<i>White</i>	3.04%	0.00%	15.07%	4.88%	0.00%
<i>Other</i>	1.78%	0.00%	5.48%	0.00%	0.00%
<i>Engagement with Roca</i>					
<i>Referred</i>	44.19%	44.90%	42.50%	43.90%	45.45%
<i>Youth Worker</i>	18.06%	20.41%	16.25%	12.20%	20.20%
<i>Mandated</i>	16.77%	20.41%	18.75%	7.32%	21.21%
<i>Walk-in</i>	14.84%	8.16%	16.25%	29.27%	5.05%
<i>Other</i>	6.13%	6.12%	2.50%	7.32%	8.08%

2.2.2 Impact Analysis

We used a multi-step process to assess the impact of Roca’s CBT on our outcomes of interest. First, we examined the relationship between CBT dosage and measures of engagement at Roca, employment, and recidivism, and the degree to which this relationship varies according to characteristics of the Roca participant. We then tested the impact of receiving a high level of CBT dosage in a participant’s first three months of engagement in Roca, relative to receiving a low level of CBT dosage during that timeframe, on later engagement with Roca, employment, and recidivism.

2.2.2.1 Administrative Data

In this section we describe the sample, outcomes and treatment variables, descriptive dosage analysis, and quasi-experimental dosage analysis.

2.2.2.1.1 Sample

All outcome analyses used the sample of all individuals who have an eligibility date that started after September 1, 2018 and participated in Roca for over 90 days (N=524). All CBT dosage variables covered the first three months at Roca, and all outcome measures covered all time after these first three months. We evaluated the impact of receiving high levels of CBT at Roca during an individual’s first 90 days with Roca on eight outcome measures assessed during the period of time after that 90 days.

2.2.2.1.2 Outcome Measures

We test eight outcomes: four primary outcomes and four secondary outcomes. Based on the theoretical basis for Roca’s CBT curriculum as articulated in the skills manual, we anticipate that primary outcomes will be directly affected by CBT, but that secondary outcomes will be only indirectly affected by CBT.

Primary Measures

We identified four primary outcomes which function as our indications of impact: 1) increased successful rate of Youth Worker contact (rate of actual contacts over the rate of actual, attempted, and third party contacts); 2) the monthly rate of program attendance (number of Roca programs attended in a month); 3) increased likelihood of gaining employment, as measured by engagement in transitional employment programming (TEP); and 4) increased likelihood of gaining employment, as measured by obtaining unsubsidized employment.

By program design, Roca participants often begin with little, if any, interest in engaging in the program. One of the primary goals of CBT is to increase the likelihood that participants will engage. Thus, one indication of the impact of CBT is increased likelihood of engagement in the Roca model later in the program as a result of a high dose of CBT early in the program. This relationship was assessed using outcomes 1 and 2. Overall, the mean rate of successful contact is 52% with a standard deviation of 32% and the mean rate of monthly program attendance is 6.96, with a standard deviation of 9.91. In addition, CBT is designed to change thoughts and actions in a manner that allows for greater readiness for employment. This relationship is assessed through outcomes 3 and 4. Overall, we found that 20% of Roca participants enroll in TEP, and 9% find unsubsidized employment.

Secondary Measures

Ultimately, CBT should also have an influence on thinking and actions that is reflected in reductions in criminal activity. As such, we included additional long-term secondary, or ultimate outcomes in our analyses. To measure reductions in criminal justice activity, we examined reductions in 1) the likelihood of an arrest or arraignment for any offense; 2) the likelihood of an arrest or arraignment for a violent offense¹¹; 3) the likelihood of a conviction for any offense; and 4) the likelihood of a conviction for a violent offense. Arrests and arraignments are the most direct measure of recidivism, but Roca participants are high risk and likely to be rearrested or rearraigned often. As an individual participates in Roca programming, though, they may engage in less serious criminal behavior, a measure that is captured by a reduction in violent offending as captured by the charge on arrest. Because arrests and arraignments can be made without sufficient evidence to support conviction, the use of convictions as an additional measure allowed for a clearer indicator of criminal behavior. Arrests and arraignments provide immediate and comprehensive measures of all possible criminal behavior but risk some amount of error due to issues and biases in criminal justice processing. Convictions are a less error-prone measure due to a higher level of scrutiny but are a less immediate and comprehensive measure. Overall, we found that 34% of Roca participants were arrested or arraigned for any offense, 13% were arrested or arraigned for a violent offense, 4% were convicted of any offenses, and 1% were convicted of a violent offense.

2.2.2.1.3 Treatment Variables

For the descriptive dosage analysis, we used three measures to describe CBT dosage. The first measure used the monthly rate of CBT provided by Youth Workers (hereafter, “Youth Worker CBT”). These indicators tended to be categorized as informal versions of CBT, but could include the use of formal aspects of the CBT curriculum outside of a classroom setting. Overall, there are an average of 1.49 CBT contacts per month (standard deviation = 1.91, minimum = 0, maximum = 11.33). The second measure is the monthly rate of CBT program attendance (hereafter, “CBT programming”). This indicator is the use

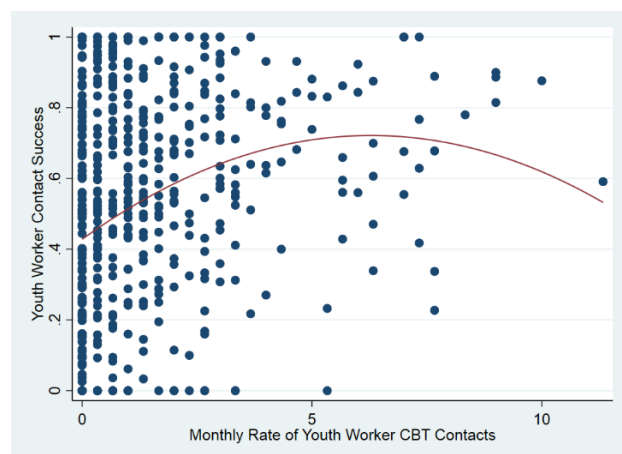
¹¹ Violent offenses include homicide, rape and other sexual assault, robbery, and various forms of physical assault.

SECTION 2: METHODS AND ANALYSIS

of formal CBT within a classroom. Overall, there are an average of 1.17 CBT class attendances per month (standard deviation = 0.49, minimum = 0, maximum = 8.67). The final measure is the number of unique skills reviewed either through Youth Worker CBT or CBT programming. Overall, this number ranged between 0 and all 7 skills, with a mean of 4.36 and a standard deviation of 2.47.

For the quasi-experimental dosage analysis, we used four dichotomous variables that indicated high levels of CBT. To determine the cut points for a high dosage, we explored quadratic relationships between the continuous CBT measures and the outcome measures to determine if there was a point at which gains in outcomes notably increased. These analyses yielded few significant relationships between squared or cubed versions of the continuous CBT variables, and where they did, they were always in the direction of a leveling off of the impact after a very high level of CBT. Figure 2.2.2-1 illustrates this finding. The figure displays a scatter plot of the monthly rate of Youth Worker CBT in the first three months against Youth Worker contact success after the first three months. The prediction for Youth Worker contact success is calculated from a linear regression of Youth Worker contact success on the rate of Youth Worker CBT and the monthly rate of Youth Worker CBT squared. The result of this production is the plotted curve, which highlights a statistically significant relationship ($p < 0.001$): by the time 6.29 CBT contacts are made per month, the effect of Youth Worker CBT on contact success begins to level.

Figure 2.2.2-1. Scatter Plot and Fitted Quadratic Curve for the Monthly Rate of CBT Contacts Against Youth Worker Contact Success



Because quadratic relationships failed to identify a clear demarcation at which the impacts of dosage notably improved, we use two approaches to identify high dosage. First, for each of the three continuous measures of dosage, we used any value above the mean as an indication of high dosage: Youth Worker CBT above 1.49 indicated a high rate for Youth Worker CBT; CBT programming above 1.17 indicated a high rate of CBT programming; and 5 or more skills indicated a high rate of CBT skills. The overall rates for each of these indicators, respectively, are 33%, 37%, and 56%. For our final measure of a high dosage, we use Roca's ideal goals for CBT receipt as described by the Re-Wire skills manual. This goal suggests that Youth Worker CBT of 8 or greater per month, CBT programming of 4 or greater per month, and all 7 skills would be a high dose of CBT. Few individuals achieved any of these measures on their own. For example, only 1% of Roca participants achieved the Youth Worker CBT goal. For this reason, we created a combined indicator of any of these three indicators of dosage occurring. For example, an individual with a low rate of Youth Worker contacts and skills, but a high rate of programming, would receive a high score on this measure. The same is true for skills and Youth Worker CBT. Overall, 29% of participants received a high score on this measure.

2.2.2.1.4 Primary Analysis: Descriptive Dosage Analysis

We began our impact analyses with a descriptive dosage analysis. The goal of this analysis was to explore the relationship between CBT dosage and our outcomes of interest, allowing for a clearer understanding of the impact of CBT and an improved estimate of treatment impacts through this understanding.

First, we ran a series of bivariate ordinary least squares regression models, where we regressed each of the eight outcomes on each of the three measures of dosage. For dichotomous outcomes wherein we estimated a linear probability model, we incorporated a measure of the natural log of the time at risk following the first 90 days to account for varied exposure times across participants. This approach tested whether any relationships exist between these measures. Specifically, we estimated the following models:

$$Y_i = \alpha + \beta_1 CBT_i + \beta_2 Time_i + \varepsilon_i \quad (1)$$

in which $i = 1, \dots, N$ indexes participants; Y are the eight outcome variables; α is the intercept; β_1 is the slope for one of the three CBT measures; β_2 is the slope for time, which is included for dichotomous outcomes and excluded for continuous outcomes; and ε_i is the residual.

Next, we estimated these relationships using fully specified regression models. Because Roca collects a great deal of information on their participants, we were able to control for factors strongly linked to participant outcomes, which helped us isolate the unique effect of CBT. Controlling for these factors allowed us to test whether any relationships observed in the bivariate analyses persisted after accounting for differences in baseline characteristics. We controlled for age at eligibility, race/ethnicity, employment status at the time of eligibility, educational status at the time of eligibility, whether someone if a parent or expectant parent, any significant past traumatic experiences, current gang membership, current drug use or sales, the number of prior convictions, a prior felony, prior arraignments or arrests for violent crimes, prior arraignments or arrests for weapons crimes, an indicator of overlap with the COVID-19 pandemic, and Roca site.

We controlled for age (mean - 20.18, standard deviation - 2.42) because maturity may be linked to receptivity to Roca programming, including CBT, and research strongly shows a link between age and criminal behavior.^{12,13} We controlled for race and ethnicity (Black, non-Hispanic – 54%; White, non-Hispanic – 3%; Bi/Multi Racial – 3%; Other Race, non-Hispanic – 2%; Hispanic/Latino – 30%; Unknown/Not Reported – 8%) due to biases in the criminal justice system likely to affect these outcomes.^{14,15} We controlled for recent employment (25%) as this likely predicts their chances of future employment. We controlled for whether an individual has a high school degree or equivalent (44%) as this may predict their willingness to participate in formal, classroom programming, affect their chances of

¹² Loeber, R., & Farrington, D. P. (2014). Age-Crime Curve. In G. Bruinsma & D. Weisburd (Eds.), *Encyclopedia of Criminology and Criminal Justice* (pp. 12-18). New York, NY: Springer New York.

¹³ Loeber, R., Menting, B., Lynam, D. R., Moffitt, T. E., Stouthamer-Loeber, M., Stallings, R. Pardini, D. (2012). Findings from the Pittsburgh Youth Study: Cognitive Impulsivity and Intelligence as Predictors of the Age-Crime Curve. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51, 1136-1149.

¹⁴ Brunson, R. K., & Miller, J. (2006). Gender, Race, and Urban Policing: The Experience of African American Youths. *Gender & Society*, 20, 531-552.

¹⁵ Gelman, A., Fagan, J., & Kiss, A. (2007). An Analysis of the New York City Police Department's "Stop-and-Frisk" Policy in the Context of Claims of Racial Bias. *Journal of the American Statistical Association*, 102, 813-823.

SECTION 2: METHODS AND ANALYSIS

obtaining employment, and affect the likelihood of recidivism.¹⁶ We controlled for parental status as parenting skills are a focus of Roca programming and may influence motivation to obtain employment and avoid recidivism. We controlled for any significant past traumas (i.e., disasters, serious accidents, physical and sexual assaults, combat, captivity, or series injury; 63%) as such trauma is likely linked to a need for CBT. We controlled for current gang membership (66%) as gangs may provide messages contradictory to Roca's messages, and make recidivism more likely.¹⁷ We controlled for current drug use or sales as untreated drug issues increase the likelihood of recidivism.¹⁸ We controlled for the number of prior convictions (mean = 2.22, standard deviation = 4.77) to provide a sense of how extensive an individual's criminal history was, as one of the most established predictors of future offending is past offending.^{19,20} We controlled for the presence of a prior felony (60%) as this is likely to impact employment.²¹ Because many Roca participants have violent histories and one of Roca's primary goals for CBT is to reduce future violence, we controlled for past arrests or arraignments for violent (47%) or weapons (50%) offenses to account for differences in the likelihood for future violent offenses. We controlled for whether an individual started their time at Roca during the pandemic (19%) or started at Roca before the pandemic but were still active during the pandemic (68%) because the COVID-19 pandemic affected programming at Roca, job opportunities, and criminal justice functioning. Finally, we controlled for Roca Site (Baltimore – 35%, Boston – 19%, Chelsea – 23%, Springfield 23%) as different sites function slightly differently, a factor likely to contribute to differing levels of CBT, and because both economic conditions and criminal justice functioning varies by city, county, and state.

Specifically, we build on Equation 1 and estimate the following models:

$$Y_i = \alpha + \beta_1 CBT_i + \beta_2 Time_i + \beta_3 ParticipantCharacteristics_i + \varepsilon_i \quad (2)$$

in which $i = 1, \dots, N$ indexes participants; Y are the eight outcome variables; α is the intercept; β_1 is the slope for one of the three CBT measures; β_2 is the slope for time, which is included for dichotomous outcomes and excluded for continuous outcomes; β_3 are the slopes for the control variables described above; and ε_i is the residual.

Finally, we explored interaction effects with factors likely to influence both CBT dosage and the various outcomes to determine if CBT is more or less effective for participants with different histories. For example, it may be that for some Roca participants, CBT programming is less effective in increasing Roca involvement because the messages that these individuals receive from their gang might conflict with messages they receive in CBT. Such insight into potential moderators of CBT effectiveness provides a

¹⁶ Lochner, L., & Moretti, E. (2004). The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports. *American Economic Review*, 94, 155-189.

¹⁷ Pyrooz, D. C., Clark, K. J., Tostlebe, J. J., Decker, S. H., & Orrick, E. (2021). Gang Affiliation and Prisoner Reentry: Discrete-Time Variation in Recidivism by Current, Former, and Non-Gang Status. *Journal of Research in Crime and Delinquency*, 58(2), 192–234.

¹⁸ Huebner, B. M., & Cobbina, J. (2007). The Effect of Drug Use, Drug Treatment Participation, and Treatment Completion on Probationer Recidivism. *Journal of Drug Issues*, 37(3), 619–641.

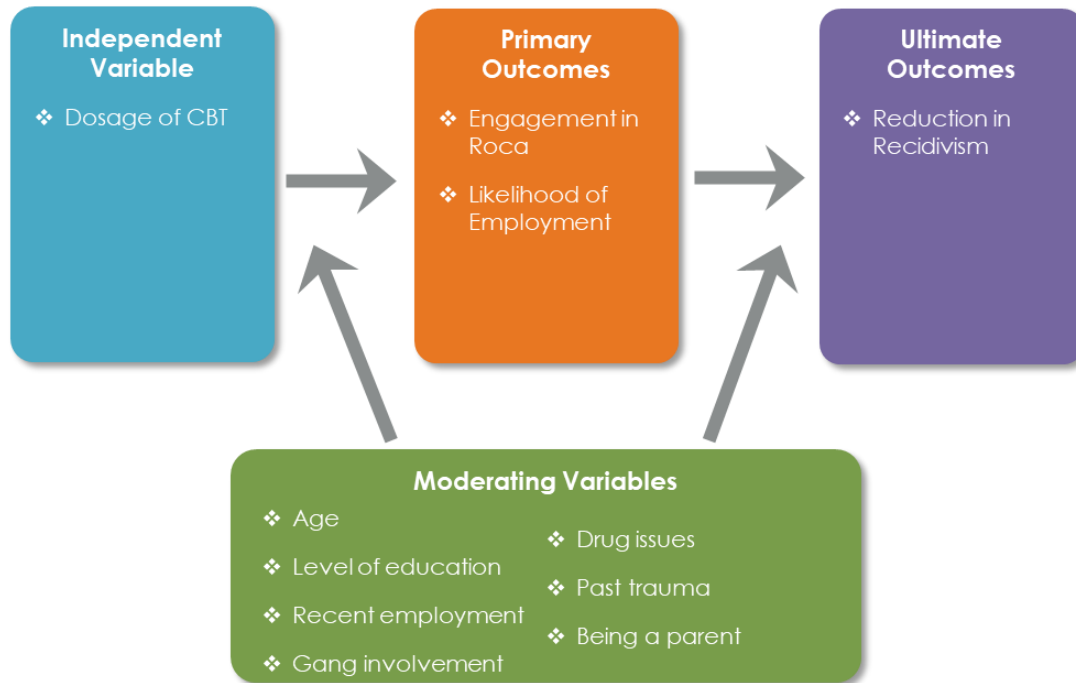
¹⁹ Bushway, S. D., Nieuwebeerta, P., & Blokland, A. (2011). The Predictive Value Of Criminal Background Checks: Do Age And Criminal History Affect Time To Redemption?. *Criminology*, 49, 27-60.

²⁰ Kurlychek, M. C., Brame, R., & Bushway, S. D. (2006). Scarlet Letters And Recidivism: Does An Old Criminal Record Predict Future Offending?. *Criminology & Public Policy*, 5, 483-504.

²¹ Agan, Amanda, and Sonja Starr. 2017. "The Effect of Criminal Records on Access to Employment." *American Economic Review*, 107 (5): 560-64.

richer understanding of how CBT affects change among Roca participants. Figure 2.2.2-2 maps potential moderators of the impact of CBT on outcomes.

Figure 2.2.2-2. Potential CBT Moderating Pathways



Because age, level of education, recent employment, gang involvement, drug issues, past trauma, and parental status are all likely to be linked to either the need for CBT or motivation to participate in CBT, we tested whether the effects of CBT vary by these measures. Specifically, we build on equation 2 and estimate the following model:

$$\begin{aligned}
 Y_i = & \alpha + \beta_1 CBT_i + \beta_2 InteractionVariable_i & (3) \\
 & + \beta_3 CBT * InteractionVariable_i + \beta_4 Time_i \\
 & + \beta_5 ParticipantCharacteristics_i + \varepsilon_i
 \end{aligned}$$

in which $i = 1, \dots, N$ indexes participants; Y are the eight outcome variables; α is the intercept; β_1 is the slope for one of the three CBT measures when the interaction variable is 0; β_2 is the slope for the interaction variable when the CBT measure is zero; β_3 is the slope for interaction effect between the interaction variable and the CBT measure; β_4 is the slope for time, which is included for dichotomous outcomes and excluded for continuous outcomes; β_5 are the slopes for the control variables described above; and ε_i is the residual.

2.2.2.1.5 Secondary Analysis: Quasi-Experimental Dosage Analysis

Analyses described in the previous section are descriptive and exploratory. To isolate the impact of a high level of CBT, we used a rigorous quasi-experimental design to compare the effectiveness of a high level of CBT to a low level of CBT. We used four indicator variables for a high dosage of CBT to identify the impact of receiving more than the average amount of CBT.

Individuals receiving a high level of CBT are likely different from those receiving a low level of CBT on a number of measures that are independently linked to future Roca engagement, employment, and recidivism. Once we identified low and high CBT groups, we needed to adjust for differences between these groups because it may be these differences, not CBT, that cause different outcomes across the two groups. While randomly assigning individuals to receive low and high levels is the best way to handle this issue, random assignment was not feasible for this study. Further, the allocation of individuals to high and low CBT groups did not fall into clear patterns that my support non-randomized designs such as regression discontinuity or instrumental variables. In the absence of such opportunities, a common method for addressing this issue is to match individuals on variables empirically and theoretically related to the treatment condition (i.e., CBT dosage) in order to reduce pre-treatment difference between the two groups.^{22,23} Once matching was complete, regression models were used to further adjust for any remaining differences. Regression models are highly dependent on correct model specification but matching combined with model specification provides “two bites at the apple”²⁴ with estimates being consistent if either matching or the regression model is correctly specified. In short, matching combined with regression models allows us to have greater confidence that the final estimates accurately represent the impact of CBT.

Coarsened Exact Matching

We used coarsened exact matching (CEM) to match individuals receiving high and low levels of CBT. CEM involved coarsening covariates into categories, or bins, and then matching exactly across these bins. Covariates were returned to their original values for analysis, and groupings of bins that did not include at least one treatment and comparison unit were dropped. Bins with multiple treatment and comparison units were assigned weights based on the number of matched treatment and comparison units.^{25,26} CEM has a number of advantages over other matching methods, including that it allows analysts to make theoretically informed choices about how to match across variables, addresses imbalances in multivariate nonlinearities, and it restricts data to an area of common support which reduces extrapolations of the causal effect across vastly different units.^{ibid}

We used regressions of the four treatment indicators (Youth Worker CBT, CBT programming, CBT skills, and Roca’s goals for CBT) on various risk factors collected by Roca and our theoretical knowledge to determine our set of matching variables, which include whether an individual started Roca during the COVID-19 pandemic, Roca site, any recent employment, a high school degree or equivalent, whether one had harmed others in the past, whether one participated in counseling before Roca, current gang membership, parental status, age (broken down into under 18 and 18 or over), and number of prior convictions (broken down into 5 or fewer and more than five). We provide balance tables for these variables across each of the four treatment groups in Appendix C, Tables C.6 – C.9. These tables show the pre- and post-matching rates and sample sizes in each group, weighted and unweighted. We also

²² Heckman, J. J., & Smith, J. A. (2001). The Pre-programme Earnings Dip and the Determinants of Participation in a Social Programme. Implications for Simple Programme Evaluation Strategies. *The Economic Journal*, 109, 313-348.

²³ Heinsman, D. T., & Shadish, W. R. (1996). Assignment methods in experimentation: When do nonrandomized experiments approximate answers from randomized experiments? . *Psychological Methods*, 1, 154-169.

²⁴ Gaes, G.G., Bales, W.D. & Scaggs, S.J.A. (2016). The effect of imprisonment on recommitment: an analysis using exact, coarsened exact, and radius matching with the propensity score. *J Exp Criminol* 12, 143–158; p.153.

²⁵ Blackwell, M., Iacus, S., King, G., & Porro, G. (2009). cem: Coarsened exact matching in Stata. *Stata Journal*, 9, 524-546.

²⁶ Iacus, S. M., King, G., & Porro, G. (2017). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis*, 20, 1-24.

SECTION 2: METHODS AND ANALYSIS

provide an overall L_1 statistic as well as an L_1 statistic for each variable. The overall L_1 statistic is a multidimensional measure of balance in which scores close to zero indicate greater overall balance. The L_1 statistics presented for each variable are unidimensional measures of imbalance in which scores close to zero indicate greater balance on a particular variable. A Tables C.6 – C.9 highlight (see Appendix C), matching improved balance across all variables. On the multidimensional measure, we observed 11% (Youth Worker CBT), 10% (CBT programming), 20% (CBT skills), and 22% (any CBT measure of reaching Roca goals) reductions in in the L_1 statistic, indicating improvements in line with those observed in other uses of CEM.^{27, 28, 29}

After matching, regression models akin to that used in Equation 2 were run to estimate program treatment (i.e., CBT dosage) effects. The only difference between the models run for this analysis and those presented in Equation 2 is that we used dichotomous, not continuous, measures of CBT. Control and outcome variables were the same. For dichotomous outcomes, we also estimated survival models to account for time at risk using cox proportional hazard models. Control covariates were identical, and the logged measure of time was removed for these models.

Sensitivity Analysis

As a sensitivity analysis, we re-estimated treatment affects using inverse-probability-weighted regression adjustment (IPWRA). IPWRA applies weights based on the likelihood that a unit would be in the treatment group, using these weights to adjust for differences at baseline like matching. While this approach has disadvantages that CEM does not have (i.e., does not allow for theoretical selection of matching, does not restrict data to an area of common support) it has advantages that that CEM does not, including that it allows for the retention of all observations and allows for the incorporation of a wide range of weighting variables. IPWRA offers a good check on the validity of the conclusions drawn using CEM. We included additional weighting variables, including number of prior traumatic experiences, whether someone was assaulted before, number of prior arrests, any prior juvenile sentence, any prior adult sentence, any medical issues, living in less stable housing, use of public housing support, use of public health care, use of public food support, use of public economic support, number of prior felonies, number of prior incarcerations, number of prior felony incarcerations, past drug arraignments, number of total days spent incarcerated, and the most serious prior offense type. Variance ratios and chi-squared tests for balance suggested successful balancing across these measures.

Our use of multiple outcome measures to assess the impact of CBT on Roca participants' outcomes was rooted in our understanding of the expected effects of CBT within the Roca model. CBT within Roca is designed to directly influence engagement with programming and readiness for employment. By increasing Roca participation and readiness for employment, CBT is likely to have an impact on reductions in criminal behavior. Further, CBT at Roca comes in many forms, and assessing CBT as a monolith misses the different experience of each of those forms, thus necessitating the four treatment indicators. While it is generally best to choose only a single outcome and treatment measure when testing program impact, doing so would ignore the multiple goals behind CBT within Roca and the multiple modes of CBT administration. To address this issue, we treated successful rate of Youth Worker contact, monthly rate of program attendance, TEP, and unsubsidized employment as our primary outcomes. We

²⁷ Dooley, B. D., Seals, A., & Skarbek, D. (2014). The effect of prison gang membership on recidivism. *Journal of Criminal Justice*, 42, 267-275.

²⁸ Nie, M., & Waltenburg, E. N. (2018). The Impact of the Black Media on Diffuse Support for the U.S. Supreme Court. *Du Bois Review: Social Science Research on Race*, 14, 603-620.

²⁹ Owens, R. J., & Wohlfarth, P. C. (2014). State Solicitors General, Appellate Expertise, and State Success Before the U.S. Supreme Court. *Law & Society Review*, 48, 657-685.

treated all other outcomes as exploratory, and not necessarily indicative of CBT's success or failure. While the use of multiple outcome measures is theoretically justified, it is important to correct for the increased likelihood of a Type I error caused by testing multiple hypotheses. We employed the Bonferroni correction to address the problem of multiple comparisons for the confirmatory outcomes, adjusting within each variable type. With eight hypothesis tests for program engagement measures (four treatment measures and two outcome measures), 0.006 (0.05/8) is the measure we used to test statistical significance for program engagement. With eight hypothesis tests for employment measures (four treatment measures and two outcome measures), 0.006 (0.05/8) is the measure we used to test statistical significance for employment. With sixteen hypothesis tests for recidivism measures (four treatment measures and four outcome measures), 0.003 (0.05/16) is the measure we used to test statistical significance for recidivism.

The Impact of the COVID-19 Pandemic

The COVID-19 pandemic affected both Roca programming and the functioning of agencies and sectors responsible for several of our external outcome measures (e.g., criminal justice processing, employment opportunities). Because the COVID-19 pandemic represented such a small portion of our analytic timespan³⁰ it is unlikely the pandemic will change the overall findings. Nonetheless, we accounted for the impact of COVID-19 by including a variable that categorized each participant in three categories: became eligible during the pandemic, became eligible before the pandemic but was still active at Roca during the pandemic, and has no overlap with the pandemic. In addition, we matched on and weighted whether an individual became eligible for Roca during the pandemic. Finally, we re-ran our main analyses excluding those who became eligible during the pandemic as a sensitivity test.

2.2.2.2 Participant Survey Data

Survey data analyses for the impact analysis were modeled after the administrative data analyses. We used multivariate regression models to explore the relationship between Roca participants' outcomes and indicators of CBT engagement. Regression models were run in steps, first controlling for site and eligibility date (pre-COVID-19 versus during COVID-19), then adding age and race/ethnicity as covariates (we also controlled for pre-Roca measures of outcomes for which we had such measures, specifically employment and education). Because of the relatively small survey sample, we added covariates in multiple steps to assess with more precision which of these factors matter most in each association explored. We also determined that because of the small sample, there would not be adequate power to control for as many covariates as were included in the analyses of the administrative data.

³⁰ We measure the impact of the COVID-19 pandemic on the functioning of Roca and various Massachusetts institutions as beginning on March 15, 2020. Thus, for our analyses, only the time between March 15, 2020 and December 20, 2020 is affected by the pandemic. The time between September 1, 2018 and March 14, 2020 was unaffected by the pandemic.

3. Findings

3.1 Roca's CBT Curriculum

Our assessment of fidelity to the CBT curriculum as designed for Roca was framed by the “What does delivering CBT at Roca look like?” section of the Re-Wire CBT Skills Manual Introduction:

Formal Practice:

1. Establishing rapport with the individual.
2. Checking in on emotional and behavioral experiences in the past week (tracked weekly).
3. Checking in on problems that may have come up in the past week that the individual wants to focus on in class.
4. Review of skills practice in the past week.
5. Or, identifying a recent situation where the individual wished they had used a skill.
6. Teaching (or reviewing) a new skill.
7. Assign skill to practice over the next week.

Informal Practice:

1. Modeling of CBT skills, fostering a therapeutic environment.
2. Daily interactions with young people are goal-oriented.
3. Capitalizing on “teaching moments.”

3.2 Implementation of and Fidelity to CBT Curriculum

3.2.1 Degree of CBT Implementation

3.2.1.1 Participant Dosage of CBT

We began our analysis by describing the levels of CBT received overall and within each site. Table 3.2.1-1 displays various measures of CBT engagement by Roca participants overall and across sites. Roca participants received an average of 1.24 CBT related Youth Worker contacts per month and attended an average of 1.03 CBT-related programs. Of Youth Worker contacts that contained CBT, conversational CBT was the most common type documented (0.74/month) followed by informal with visuals (0.41/month) and then formal (0.18/month). Almost a quarter of all Youth Worker contacts and programming involved CBT.

Table 3.2.1-1. Roca Participant CBT Engagement Overall and by Roca Site

Variable	Overall Mean (SD)/ Percent	Boston Mean (SD)/ Percent	Chelsea Mean (SD)/ Percent	Springfield Mean (SD)/ Percent	Baltimore Mean (SD)/ Percent
<i>Monthly Youth Worker CBT Contacts</i>					
<i>Overall</i>	1.24 (1.47)	2.00 (1.96)	0.64 (0.94)	0.87 (0.93)	1.33 (1.30)
<i>Conversation Only</i>	0.74 (1.17)	1.40 (1.69)	0.32 (0.81)	0.48 (0.67)	0.63 (0.70)

SECTION 3: FINDINGS

<i>Informal With Visuals</i>	0.41 (0.72)	0.66 (0.95)	0.13 (0.17)	0.19 (0.24)	0.67 (0.91)
<i>Formal</i>	0.18 (0.36)	0.18 (0.29)	0.21 (0.31)	0.22 (0.52)	0.18 (0.17)
<i>Rate of Youth Worker CBT Contacts Over All Youth Worker Contacts</i>	0.22 (0.21)	0.37 (0.26)	0.11 (0.11)	0.13 (0.11)	0.24 (0.18)
<i>Monthly CBT Program Attendance</i>	1.03 (1.18)	0.76 (1.04)	0.63 (0.65)	1.30 (1.30)	1.41 (1.40)
<i>Rate of CBT Programming Over All Programming</i>	0.32 (0.25)	0.27 (0.20)	0.22 (0.21)	0.29 (0.21)	0.54 (0.28)
<i>Combined Monthly CBT Training</i>	2.27 (2.35)	2.77 (2.72)	1.27 (1.35)	2.18 (2.08)	2.74 (2.64)
<i>Rate of Combined CBT Training Over all Youth Worker Contacts and Program Attendance</i>	0.24 (0.18)	0.33 (0.21)	0.13 (0.11)	0.18 (0.12)	0.30 (0.19)
<i>Number of CBT Skills Reviewed</i>	5.37 (2.35)	5.85 (2.00)	5.21 (2.43)	5.58 (2.26)	4.63 (2.60)

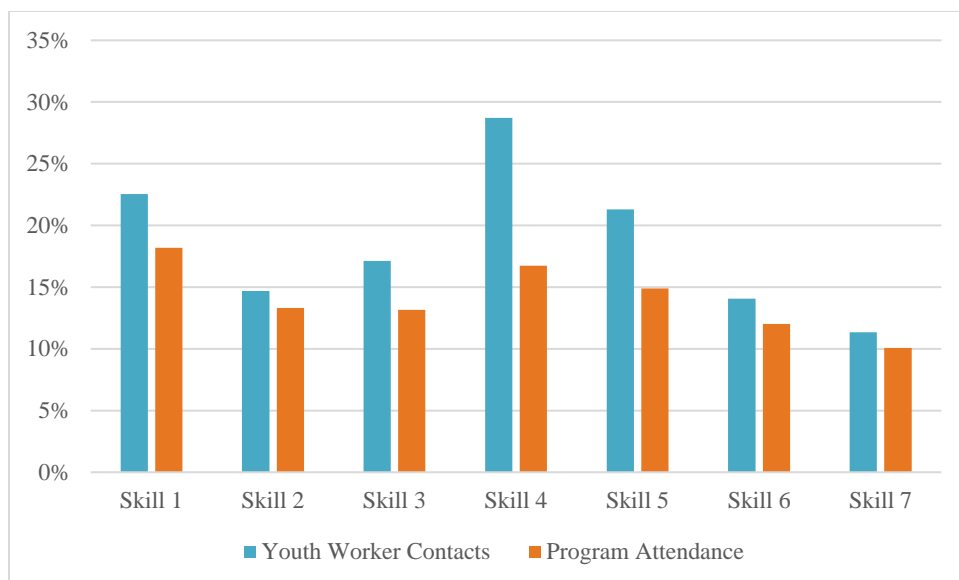
CBT engagement varied substantially by site. Participants in Boston received more CBT-related Youth Worker contacts than participants at other sites, with an average of 2.0 CBT contacts per month at the Boston site compared to 0.64 per month at the Chelsea site. These contacts were mainly informal, however, with other sites having similar or even higher frequencies of formal CBT Youth Worker contacts compared with Boston. Different site-by-site patterns existed for CBT programming, with young men at the Baltimore and Springfield sites having more frequently attended CBT programming than those at the Boston and Chelsea sites. When looking at contacts and programming combined, Boston and Baltimore had the highest average monthly occurrences of CBT training and the highest rates of Roca activities that included CBT. However, training for participants in Baltimore incorporated the least number of CBT skills of all the sites.

For the most part, these overall findings mirror those that existed prior to the COVID-19 pandemic; however, there are a few differences. The most remarkable difference was at the Boston site, where CBT engagement across multiple measures was noticeably lower pre-COVID-19. See Table C.1 in Appendix C for a full breakdown of CBT engagement measures pre-COVID-19.

Figure 3.2.1-1 shows how often each CBT skill was practiced during CBT-related Youth Worker contacts and programming. Skills 1 (Be Present), 4 (Act On Your Values), and 5 (Stick With It) were the most commonly practiced skills during both types of engagement. Skill 7 (Solve It) was the least practiced skill during both Youth Worker contacts and programming. All skills are slightly more likely to be practiced during Youth Worker contacts, indicating that these contacts are more likely to involve training in more than one skill compared with programming.

Figure 3.2.1-1. Frequency CBT Skill Practice During Youth Worker Contacts and Programming

SECTION 3: FINDINGS



Next, we examined the relationship between the characteristics of Roca participants and CBT engagement to assess whether there are Roca participants who may be more receptive to or in greater need of CBT. Specifically, we looked at criminal history, demographics, and other information collected at intake. We estimated a regression for each combination of a measure of CBT engagement and a participant characteristic, regressing CBT on the participant characteristic while controlling for the Roca participant's site and overlap with the COVID-19 pandemic. In Table 3.2.1-2, we present the relationships between these characteristics and CBT engagement at Roca. Significant findings are bolded.

Table 3.2.1-2. Bivariate Regressions of CBT Engagement on Characteristics of Roca Participants¹

Variable	Monthly Youth Worker CBT Contacts ² Coefficient (SE)	Rate of Youth Worker CBT Contacts Over All Youth Worker Contacts ² Coefficient (SE)	Monthly CBT Program Attendance ² Coefficient (SE)	Rate of CBT Programming Over All Programming ² Coefficient (SE)	Number of CBT Skills Reviewed ² Coefficient (SE)
<i>Number of Arrests (n= 890)</i>	-0.01 (0.01)	0.00 (0.00)	-0.01 (0.01)	0.00 (0.00)	-0.02 (0.01)*
<i>Number of Prior Convictions (n=1,036)</i>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.01)
<i>Number of Prior Felonies (n=1,036)</i>	0.01 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.03 (0.01)
<i>Number of Prior Incarcerations (n=1,036)</i>	-0.01 (0.01)	0.00 (0.00)	-0.01 (0.00)	0.00 (0.00)	0.01 (0.01)
<i>Number of Prior Felony Incarcerations (n=1,036)</i>	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.03 (0.02)
<i>Any Prior Arraignments for a Violent Offense (n=1,036)</i>	0.11 (0.09)	0.00 (0.01)	0.00 (0.07)	0.00 (0.01)	-0.07 (0.14)
<i>Any Prior Arraignments for a Drug Offense (n=1,036)</i>	-0.02 (0.08)	-0.01 (0.01)	0.04 (0.07)	0.01 (0.01)	0.24 (0.14)

<i>Any Prior Arraignments for a Weapons Offense (n=1,036)</i>	0.14 (0.08)	0.01 (0.01)	0.06 (0.07)	0.00 (0.01)	-0.07 (0.14)
<i>Number of Prison Sentence Days (n=1,036)</i>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>Age at Eligibility (n= 1,034)</i>	0.03 (0.02)	0.00 (0.00)	0.00 (0.1)	-0.01 (0.00)*	0.04 (0.03)
<i>Current Gang Involvement (n= 1,036)</i>	0.00 (0.08)	0.00 (0.01)	-0.14 (0.07)	0.00 (0.00)	-0.15 (0.14)
<i>Drug Use or Sales (n= 1,036)</i>	0.05 (0.09)	0.00 (0.01)	-0.11 (0.08)	0.03 (0.01)*	0.17 (0.15)
<i>Current or History of Use of Medication or a History of Hospitalizations (n= 951)</i>	-0.01 (0.09)	-0.01 (0.01)	-0.05 (0.08)	0.01 (0.02)	0.00 (0.14)
<i>Counseling History (n= 951)</i>	0.07 (0.08)	0.00 (0.01)	0.04 (0.07)	0.00 (0.012)	0.08 (0.13)
<i>High School Degree or GED (n= 959)</i>	-0.12 (0.08)	0.00 (0.01)	0.04 (0.07)	0.03 (0.02)*	-0.20 (0.13)
<i>Any Public Assistance (n= 925)</i>	0.09 (0.10)	0.02 (0.01)	0.04 (0.09)	-0.02 (0.02)	0.00 (0.16)
<i>Use of Housing Assistance (HUD) (n= 1,036)</i>	0.06 (0.14)	-0.02 (0.02)	0.07 (0.12)	0.00 (0.02)	0.51 (0.20)*
<i>Use of Healthcare Assistance (MassHealth, Medicaid) (n= 1,036)</i>	-0.08 (0.10)	0.00 (0.01)	-0.07 (0.08)	-0.01 (0.01)	0.39 (0.16)*
<i>Use of Food Assistance (SNAP, WIC) (n= 1,036)</i>	0.11 (0.09)	0.01 (0.01)	0.14 (0.07)	0.00 (0.02)	0.41 (0.14)**
<i>Use of Social Security (n= 1,036)</i>	0.11 (0.12)	0.00 (0.02)	0.02 (0.10)	0.00 (0.02)	0.36 (0.22)
<i>Use of Welfare (n= 1,036)</i>	0.30 (0.16)*	0.01 (0.02)	0.38 (0.15)*	0.03 (0.03)	0.66 (0.20)**
<i>Use of Other Public Assistance (n= 1,036)</i>	0.15 (0.18)	0.05 (0.03)	0.28 (0.30)	0.03 (0.05)	0.69 (0.23)**
<i>Parent (n= 959)</i>	0.00 (0.09)	-0.01 (0.01)	0.05 (0.07)	-0.01 (0.01)	0.14 (0.13)

* p<.05, ** p<.01, *** p<.001

¹All models control for Roca Site, overlap with the COVID-19 pandemic, and are run with robust standard errors.

²Ordinary least squares regression model.

³Negative binomial regression model.

Overall, CBT engagement was not significantly affected by prior criminal history. There was, however, a small relationship between number of arrests and any history of drug use or sales with CBT engagement: Roca participants with higher number of arrests were more likely to review fewer CBT skills during their time at Roca and prior history of drug use or sales was associated with a higher rate of CBT programming over all programming.

The main patterns that stand out from these analyses are tied to the effects of receiving public assistance on CBT engagement. Overall, Roca participants who received housing assistance, healthcare assistance, food assistance, welfare, or other public assistance were more likely to review a higher number of CBT skills during their time at Roca. For Roca participants receiving welfare, this trend persisted across other measures of CBT engagement. Receiving welfare was also associated with a higher monthly rate of Youth Worker CBT contacts and a higher monthly rate of CBT program attendance.

Finally, Roca participants who were younger at eligibility had a slightly lower rate of CBT programming over all programming. Participants with a high school degree or GED had a slightly higher rate of CBT programming over all programming.

3.2.1.2 Implementation of and Fidelity to CBT

We observed CBT being frequently used by staff (e.g., educators, Youth Workers, crew supervisors) across all sites. The common language provided by CBT was used by the young men and staff in a way

that promoted a culture of CBT at Roca. For example, we observed young men acknowledging when they are in a “cycle” and needed to utilize the CBT skills. One Youth Worker shared that they believe CBT is effective because, “[CBT] gives them a language through which they can discuss their issues...most people don’t think about their actions until their sitting in [a police car], but CBT makes them think first.” Youth Workers also shared that the implementation of the CBT curriculum at Roca has allowed them to dive deeper into what the young men share with them. For example, one Youth Worker believes that staff are no longer just being told that the young man is mad, but instead can use CBT to identify the feeling as anger and probe into the reasons for it. Staff incorporated CBT in various ways to meet the needs of the young men they worked with. Details about our observations of the implementation of and fidelity to the formal and informal CBT curricula are included in sections 3.2.2 and 3.2.3, respectively.

3.2.2 Implementation of and Fidelity to Formal Practice of CBT

During our observation, we frequently observed formal components of CBT being implemented across sites following the structure detailed in the skills manual.

1. **Establishing rapport with the individual.** Establishing rapport is embedded throughout Roca’s model and foundational to their overall approach. As such, staff indicated that rapport is often established prior to engaging the young men in formal CBT practice. Having strong rapport with the young men was observed to help Youth Workers identify the focus for a formal CBT lesson and to be able dig deeper when needed due to their ability to include real-life examples they know about through their relationship with the young men.
2. **Checking in on emotional and behavioral experiences in the past week (tracked weekly).** Checking in with young men about current and past experiences is also embedded in the Roca model and often captured during Relentless Outreach and when building Transformational Relationships. We often observed staff to be checking in on current emotional and behavioral experiences during formal CBT practice. Staff shared with us that CBT works best when used in the moment and it is challenging for the young men to revisit the past.
3. **Checking in on problems that may have come up in the past week that the individual wants to focus on in class.** Staff consistently identified a focus of class, but not necessarily specific to problems experienced by young men in the past week. In fact, staff often used current experiences as the focus of class. When doing so, Roca participants were observed to be more engaged in comparison to when the examples provided by the formal materials (skills manual, PowerPoint) were used. During our observations, we had many discussions with staff discussions around not only focusing on negative problems, but also on positive experiences. Staff indicated this approach has led to increased buy-in from the young men.
4. **Review of skills practiced in the past week.** During our observations, past skills were reviewed, but not specifically those taught in the past week. It may be difficult to review the specific skills taught the previous week since the young men often take different classes from each other.
5. **Or, identifying a recent situation where the individual wished they had used a skill.** Youth Workers were observed identifying a recent situation where the individual wish they used a skill when it was difficult for the Roca participant to come up with a focus for class. For example, when a young man was unable to come up with a current situation the Youth Worker identified a past work experience and compared what happened to what could have happened by walking through two different cycles.
6. **Teaching (or reviewing) a new skill.** Teaching or reviewing a new skill was the most consistently observed focus of formal CBT practice. Staff often selected the skill to teach or

review based on its application to a current situation. For example, one Youth Worker reviewed “move it” because the young man was often sleeping when the Youth Worker was trying to connect with him. Some skills were more often used than others. The skills we observed most often were “Be Present” and “Act on Your Values”. Staff indicated that “Act on Your Values” and “Flex Your Thinking” are the most accessible for staff to use because staff can relate to things that the young men value and understand if a new way of thinking would be helpful. One Youth Worker shared that they often like to teach “Be Present” in different ways, for example, by going mini golfing with the young men.

7. **Assign skill to practice over the next week.** We often observed staff assigning specific tasks related to a skill (e.g., setting an alarm to go to bed so that the young man can wake up early to go to school).

In summary, we observed fairly high levels of fidelity to the formal components of CBT as outlined in the skills manual. We did observe some variation in how the formal practice of CBT was implemented, including the format of the CBT lesson (i.e., individual or group setting), the staff person conducting a formal CBT lesson, the time spent delivering a formal lesson, and the mode of administration of the lesson material.

- Format (individual or group) was observed to have an impact on the approach used to conduct a formal CBT lesson. In Boston, due to the participants’ limited access to the building, all sessions observed were one-on-one and the majority took place during outreach or during programming that was taking place in the community. Due to privacy considerations during these situations, CBT lessons were often observed taking place in the Youth Worker’s car. As one Youth Worker noted, “it’s rare that the youth have a living situation where the CBT classes can be conducted.” In Baltimore, Chelsea, and Springfield, where participant access to the building was less of a concern than in Boston, individual and small group programming lessons were observed to be held in classrooms at the Roca building, as well as on outreach or during programming taking place in the community. In Baltimore, we observed “open sessions” focused on CBT programming regularly taking place in the open space at the Roca-Baltimore building.
- The instructor conducting the formal programming varied depending on staff availability and we observed a range of staff comfort and competency in teaching CBT. For example, staff who were well-versed in the curriculum were able to deliver the programming without referencing the skills manual whereas others read from the skills manual verbatim. We also observed that staff that demonstrated comfort and competency in teaching CBT were skilled in curtailing unproductive or disruptive behavior (e.g., young men texting on their phones) which in turn led to increased participant engagement.
- The length of time spent delivering a formal lesson also varied based on several factors including the young man’s engagement and availability. Feedback about the formal practice often included that the length of time required for the lesson is too long. One young man suggested that it be more interactive such as including puzzles.
- We also observed the formal practice of CBT being delivered using various modes of administration. Staff feedback on modes for delivering the material centered around the use of worksheets. There was often resistance from young men when asked to complete the worksheets. Therefore, some Youth Workers did not require that the young men share what they wrote and encouraged the young men to take their worksheets with them, rather than leaving them with the Youth Worker or at the Roca building. Youth Workers often had skill cards readily available and

were often observed using them, especially in the car during outreach. For example, as a Youth Worker was driving the young man, they were with was reading the cards out loud. Another Youth Worker shared that they think the skill cards help facilitate the teaching of CBT but would not use them if it had been a while since the young man had been engaged and instead would build CBT into the conversation more informally. Formal lessons were also observed being administered via the skills manual in the community and via PowerPoint slides when the technology at the Roca site was available to do so. Finally, since the young men were reviewing the skills more than once, we observed they were more receptive when the skills were taught in a variety of ways.

3.2.3 Implementation of and Fidelity to Informal Practice of CBT

During our observations we also frequently observed informal components of CBT being implemented across sites following the structure detailed in the skills manual.

1. **Modeling of CBT skills.** CBT was often observed to be infused naturally in conversation. Staff stressed that they need to figure out what CBT skills they can use themselves to help them use the skills with the young men. During our observations, staff often discussed skills they had been working on themselves with other staff members. Staff were also often observed enforcing the language of CBT with the young men, such as discussing a cycle the staff was currently in. One staff member stated, “If we don’t break our own cycle, we won’t be able to break their cycle.”
2. **Fostering a therapeutic environment.** Fostering a therapeutic environment is foundational to Roca’s model and was a component of the model prior to the introduction of CBT. Staff were often observed fostering a therapeutic environment in various aspects of programming and conversations. Fostering a therapeutic environment and remaining non-judgmental created a positive and welcoming environment that enabled young men to feel comfortable opening-up about what was happening in their lives.
3. **Daily interactions with young people are goal-oriented.** We observed many interactions with young men that were goal-oriented, however this did not necessarily occur daily because frequency depended on to the number of contacts made with the specific young man (i.e., Youth Workers did not necessarily interact with the young men on their caseloads on a daily basis). Goal-setting was often infused into conversations when Youth Workers were discussing skills with the young men. For example, one Youth Worker asked a young man how he could “stick with” going to school and they set the goal to go to bed earlier.
4. **Capitalizing on “teaching moments.”** The ability for staff to capitalize on “teaching moments” was facilitated when a therapeutic environment had been established. Staff members were observed to be presented with opportunities to tie in a CBT skill or reinforce CBT language (e.g., cycles, think-feel-do) when the young men felt comfortable opening-up about what was happening in their lives. Additionally, staff who were well versed in the CBT curriculum were able to naturally infuse CBT into conversations which allowed them to capitalize on teaching moments.

3.2.4 Self-Reported Participant Use of and Satisfaction with CBT

In the CBT section of the survey, we first asked whether the respondent knew about Roca’s CBT skills, and if they answered “yes”, they were provided a follow-up question about whether they had done CBT with Roca, and a question about how much they liked each of the skills (respondents had the option to select “I have not learned about this skill”). The vast majority of survey respondents (81%) indicated that they know about Roca’s CBT skills, whereas 12% said they were not sure if they knew about them, and

just 7% said they were not aware of them. There was no significant difference in these findings by site, but a significantly larger proportion of respondents with an eligibility date prior to COVID-19 (87%) knew about the skills than those eligible during COVID-19 (64%).

More than three quarters of respondents (76%) stated that they had ever done CBT skills with Roca. Of these, 74% said they had a class with a worksheet, 62% said their Youth Worker talked to them about skills to use in different situations, and 44% said their Youth Worker used key cards with them. There were no significant differences by site or eligibility date (pre- versus during-COVID-19) regarding whether they had done CBT with Roca.

Respondents were asked to indicate which skills their Youth Worker talked with them about. The most commonly discussed skills were Be Present (77%), Flex Your Thinking (77%), and Act On Your Values (76%), followed by Label Your Feelings (72%), Stick With It (66%), Solve It (63%), and Move It (62%). There were no significant differences by site or eligibility date (pre- versus during COVID-19).

Overall, respondents indicated that they were very satisfied with the CBT skills: on a scale from 1 to 5, with 5 being the highest rating, each of the seven skills received an average rating of at least 4 (see Table 3.2.4-1). The Flex Your Thinking skill was highest rated (4.29), followed by Act On Your Values (4.24), Solve It (4.23), and Stick With It (4.22). There was a significant difference by site for Act On Your Values ($p < .05$) such that Boston respondents rated the skill lower than respondents from other sites.

Table 3.2.4-1. Participant Satisfaction with CBT Skills Overall and By Site

CBT Skill	Overall Mean(SD)	Boston Mean(SD)	Chelsea Mean(SD)	Springfield Mean(SD)	Baltimore Mean(SD)
<i>Be Present</i>	4.08(1.09)	3.76(0.19)	4.15(0.13)	4.15(0.13)	4.08(0.14)
<i>Label Your Feelings</i>	4.13(1.10)	3.66(0.21)	4.17(0.13)	4.20(0.12)	4.26(0.14)
<i>Move It</i>	4.10(1.13)	3.84(0.19)	4.13(0.13)	4.11(0.14)	4.21(0.14)
<i>Act On Your Values</i>	4.24(1.08)	3.89(0.21)	4.35(0.12)	4.28(0.12)	4.28(0.14)
<i>Stick With It</i>	4.22(1.08)	3.82(0.20)	4.27(0.13)	4.30(0.12)	4.35(0.13)
<i>Flex Your Thinking</i>	4.29(1.04)	3.97(0.20)	4.38(0.12)	4.33(0.11)	4.28(0.13)
<i>Solve It</i>	4.23(1.09)	3.87(0.20)	4.23(0.13)	4.24(0.11)	4.35(0.13)

Participant satisfaction with CBT was also covered during our observations and conversations with staff. In general, our observations echo the survey findings that young men were generally satisfied with CBT. One Youth Worker shared that when they asked the young men what they would change about programming, the young man immediately responded “CBT is excellent. I use it for my relationship and in my everyday life”. Another young man added, “CBT works when I want it to work.” However, young men seemed to be less satisfied with or receptive to some of the more structured elements of the CBT curriculum, such as CBT classes (“they try to avoid class”) and the use of the PowerPoint slides, particularly the examples included on the slides. For example, during a class we observed, when the Educator read the “go for a walk” example, one young man said “weak” and another responded, “going for a walk doesn’t clear your mind.”

3.3 Impact of CBT on Participant Outcomes

3.3.1 Primary Analysis: Descriptive Dosage Analysis

We began the assessment of the impact of CBT at Roca on participant outcomes with simple bivariate regression models that provide an understanding of what measures of CBT are linked to what outcomes (Equation 1). The outcomes of these regressions are displayed in Table 3.3.1-1.

Table 3.3.1-1. Bivariate Regressions of Various Outcomes on Monthly Rate of Youth Worker CBT Engagement, Monthly Rate of CBT Program Attendance, and Number of Different CBT Skills Reviewed (N=524)¹

Variable	Successful Rate of Youth Worker Contacts Coefficient (SE)	Monthly Program Attendance Coefficient (SE)	Obtaining TEP Coefficient (SE)	Obtaining Unsubsidized Employment Coefficient (SE)	Any Arrest Coefficient (SE)	Any Violent Arrest Coefficient (SE)	Any Conviction Coefficient (SE)	Any Violent Conviction Coefficient (SE)
<i>Monthly CBT Youth Worker Contacts</i>	0.04 (0.01)***	0.97 (0.22)***	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0 (0.01)	0 (0)	0 (0)
<i>Monthly CBT Program Attendance</i>	0.08 (0.01)***	2.93 (0.45)***	0.05 (0.01)***	-0.02 (0.01)***	-0.03 (0.01)**	-0.02 (0.01)	-0.01 (0)	0 (0)
<i>Number of Different CBT Skills Reviewed</i>	0.07 (0.00)***	1.64 (0.15)***	0.05 (0.01)***	0.02 (0.01)***	0.01 (0.01)	0 (0.01)	0 (0)	0 (0)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

Early CBT was strongly related to later engagement with Roca and higher probabilities of employment. For each additional monthly CBT Youth Worker contact in the first three months of engagement with Roca, participants attended an average of 0.97 more programs per month after those first three months. Monthly CBT Youth Worker contacts did not have an impact on employment, but increases in the number of different CBT skills reviewed increased the probability of both TEP and unsubsidized employment. Increased monthly CBT programming attendance increased the probability of TEP but decreased the probability of unsubsidized employment. Finally, increased monthly CBT programming attendance decreased the probability of an arrest for any offense.

These findings suggest correlations between CBT and various outcomes, but do not account for differences between participants that may explain these correlations. For this reason, we next examine these relationships after controlling for a variety of risk factors (Equation 2). These findings are displayed in Table 3.3.1-2. Only the coefficients and standard errors for the CBT measures are displayed for simplicity, but output from the fully specified models are provided in Appendix C, Tables C.2 – C.4.

Table 3.3.1-2. Multivariate Regressions of Outcomes on Monthly Rate of Youth Worker CBT Engagement, Monthly Rate of CBT Program Attendance, and Number of Different CBT Skills Reviewed (N=524)¹

Variable	Successful Rate	Monthly Program Attendance	Obtaining TEP	Obtaining Unsubsi	Any Arrest	Any Violent Arrest	Any Conviction	Any Violent Conviction
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SECTION 3: FINDINGS

	of Youth Worker Contacts Coefficient (SE)	nce Coefficient (SE)	Coefficient (SE)	dized Employment Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	on Coefficient (SE)
<i>Monthly CBT Youth Worker Contacts</i>	0.06 (0.01)***	1.41 (0.22)***	0.02 (0.01)**	0 (0.01)	-0.02 (0.01)	-0.01 (0.01)	0 (0)	0 (0)
<i>Monthly CBT Program Attendance</i>	0.09 (0.01)***	2.72 (0.36)***	0.03 (0.01)**	-0.02 (0.01)*	-0.03 (0.01)*	-0.01 (0.01)	0 (0)	0 (0)
<i>Number of Different CBT Skills Reviewed</i>	0.07 (0)***	1.67 (0.16)***	0.04 (0.01)***	0.01 (0)*	0.01 (0.01)	0 (0.01)	0 (0)	0 (0)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

When controlling for Roca participant characteristics, the relationships presented in Table 3.3.1-1 remained the same, except that Monthly CBT Youth Worker contact now had a positive effect on TEP when controlling for participant characteristics. These findings suggest that these relationships are not simply due to differences in the characteristics of Roca participants who receive lower or higher levels of CBT but are indicative of the impact of CBT.

Finally, we tested for interaction effects between CBT and age, level of education, recent employment, gang involvement, drug issues, past trauma, and parental status (Equation 3). The output for all interactions is displayed in Appendix C, Table C.5, but for simplicity, here we present only those interactions that were significant. For the monthly CBT Youth Worker contact interactions:

- Participants with past trauma received less benefit from CBT in terms of future Youth Worker contacts, but they received greater benefit in terms of a higher probability of TEP enrollment.
- For participants with current gang membership, increased monthly CBT Youth Worker contacts had a diminished impact on their program attendance when compared to young men who are not in a gang.
- For participants with current drug use or sales, higher levels of monthly Youth Worker CBT contacts improved the probability of obtaining unsubsidized employment at a greater level than for those not currently using or selling drugs.

For the monthly CBT programming interactions:

- Increased age and past trauma reduced the positive effect of monthly CBT programming attendance on future Youth Worker contacts.
- Being a parent or expectant parent decreased the effect of CBT programming attendance on obtaining TEP.
- Participants with a prior high school degree received a greater benefit from CBT programming attendance on their later program attendance.

For the number of different CBT skills reviewed:

- Being a parent or an expectant parent decreased the impact of the number of skills reviewed on the probability of TEP and increased the impact on the probability of a violent arrest.
- Current drug use or sales increased the impact of the number of skills reviewed on the probability of TEP and unsubsidized employment.

In short, it appears that the effect of greater levels of CBT was relatively consistent across Roca participant characteristics, with only a few factors that showed a significant interaction effect. Among those factors, past trauma had inconsistent effects on the impact of CBT, current drug use or sales and having a high school degree or equivalent increased the effectiveness of CBT, and gang membership and being a parent or an expectant parent reduced the effectiveness of CBT.

3.3.2 Secondary Analysis: Quasi-Experimental Dosage Analysis

To examine the impact of CBT on Roca participants more precisely, we ran the post-matching regression models. Table 3.3.2-1 displays the results for the linear models we conducted after matching, and Table 3.3.2-2 displays the results for the cox proportional hazard models. For simplicity, we display only the CBT coefficients, but we controlled for all measures incorporated in Equation 2. While the primary analysis discussed in section 3.3.1 used the standard significance cut of $p < 0.05$ because analyses were exploratory and descriptive in nature, the secondary analysis described in this section uses the adjusted p values calculated using the Bonferroni corrections described in section 2.2.2.1.5.

The most notable impact of early CBT at Roca is on later engagement with Roca's overall programming. Roca participants who received more than 5 CBT skills in their first three months at Roca, have a 26% higher contact success rate during later months when compared to Roca participants who receive fewer CBT skills. Roca participants who received an above average level of monthly CBT Youth Worker contacts in their first three months attended 3.75 more classes per month in later months than participants who received fewer CBT contacts. CBT also had an impact on TEP. For TEP enrollment, CBT Youth Worker contacts and CBT programming attendance did not have an impact, but skills and meeting CBT guidelines standards did: both increased the probability of obtaining enrollment in TEP.

In the survival models, receipt of CBT that met at least one measure of Roca high dosage guidelines (i.e., CBT contacts of 8 or greater per month, CBT programming of 4 or greater per month, and receipt of all 7 skills) was linked to a reduced time to TEP enrollment. No measure of CBT programming attendance had an influence on obtaining unsubsidized employment or any of the recidivism measures. It is possible that with a larger sample or longer follow up window, significant relationships between CBT and arrests may have been observed.

Table 3.3.2-1. Multivariate Ordinary Least Squares Regressions of Various Outcomes on Monthly Rate of Youth Worker CBT Engagement, Monthly Rate of CBT Program Attendance, and Number of Different CBT Skills Reviewed after Coarsened Exact Matching¹

Variable	Successful Rate of Youth Worker Contacts Coefficient (SE) ²	Monthly Program Attendance Coefficient (SE) ²	Obtaining TEP Coefficient (SE) ²	Obtaining Unsubsidized Employment Coefficient (SE) ²	Any Arrest Coefficient (SE) ³	Any Violent Arrest Coefficient (SE) ³	Any Conviction Coefficient (SE) ³	Any Violent Conviction Coefficient (SE) ³
High Youth Worker CBT Contacts (N=223)	0.18 (0.04)***	3.75 (0.88)***	0.77 (0.05)	0.01 (0.03)	-0.1 (0.07)	0.01 (0.05)	0.01 (0.03)	0 (0.01)
High CBT Programming Attendance (N=255)	0.24 (0.03)***	5.54 (0.91)***	0.07 (0.05)	-0.01 (0.03)	-0.12 (0.06)	0.02 (0.04)	0 (0.02)	0 (0.01)

SECTION 3: FINDINGS

High Number of CBT Skills (N=256)	0.26 (0.03)***	6.09 (0.66)***	0.17 (0.05)*	0.07 (0.03)	-0.01 (0.06)	0.01 (0.04)	0.06 (0.03)	0.01 (0.01)
High CBT Per Guidelines on At Least One Measure (N=231)	0.24 (0.03)***	5.13 (0.94)***	0.18 (0.05)**	0.01 (0.04)	-0.12 (0.07)	0 (0.04)	0.02 (0.03)	0 (0)

¹All models are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

²* p<.006, ** p<.001, *** p<.0001

³* p<.003, ** p<.001, *** p<.0001

Table 3.3.2-2. Multivariate Cox Proportional Hazard Regressions of Various Outcomes on Monthly Rate of Youth Worker CBT Engagement, Monthly Rate of CBT Program Attendance, and Number of Different CBT Skills Reviewed after Coarsened Exact Matching¹

Variable	Obtaining TEP Hazard Ratio (SE) ²	Obtaining Unsubsidized Employment Hazard Ratio (SE) ²	Any Arrest Hazard Ratio (SE) ³	Any Violent Arrest Hazard Ratio (SE) ³	Any Conviction Hazard Ratio (SE) ³	Any Violent Conviction Hazard Ratio (SE) ³
High Youth Worker CBT Contacts (N=223)	2.18 (0.69)	0.47 (0.36)	0.5 (0.13)	0.92 (0.42)	0.96 (0.74)	0 (0)
High CBT Programming Attendance (N=255)	1.71 (0.46)	0.77 (0.45)	0.55 (0.13)	1.3 (0.51)	0.19 (0.19)	0 (0)
High Number of CBT Skills (N=256)	1.74 (0.61)	1.74 (1.35)	0.48 (0.13)	0.74 (0.37)	0.84 (0.65)	0.1 (0.26)
High CBT Per Guidelines on At Least One Measure (N=231)	3 (1.05)*	1.4 (0.79)	0.51 (0.15)	1.18 (0.64)	0.07 (0.14)	0 (4499.8)

¹All models are run without robust standard errors as robust standard errors cannot be estimated when CEM weights are included in survival models.

²* p<.006, ** p<.001, *** p<.0001

³* p<.003, ** p<.001, *** p<.0001

As a sensitivity analysis to test the robustness of our findings to a different approach, all linear models were re-run using IPWRA, and differences in significance or direction of effect were assessed. We found that high levels of Youth Worker CBT contacts and high levels of CBT programming attendance were associated with a significant (p<0.006) increased probability of TEP enrollment. Otherwise, we found no differences.

Finally, as a sensitivity analysis to test the robustness of our findings to disruptions of the COVID-19 pandemic, we removed participants who started at Roca after the onset of the pandemic, re-ran CEM matching and all linear models on this new sample, and assessed differences in significance or direction of effect. We found no differences.

3.3.3 Impact of CBT on Participant Outcomes - Survey Sample

In this section, we provide findings from descriptive analyses of the survey items asking about CBT-related outcomes, followed by results from regression analyses.

3.3.3.1 Descriptive outcome analyses

The survey asked a set of questions about whether respondents actual use CBT skills in their day-to-day lives. Of the respondents who said they had learned about any of the CBT skills at Roca, 86% stated that

they felt ready to use them; 5% said they did not feel ready to use them, and 9% said they were not sure if they were ready. There was a significant difference by site ($p < .05$) such that respondents from Boston were less likely to say they felt ready to use the skills (69%) than respondents from other sites (87% in Chelsea, 91% in Springfield, and 90% in Baltimore). Of those who said they were not ready to use the skills in their everyday lives or were not sure that they were ready, 51% said they needed more practice using the skills first.

Of respondents who said they felt ready to use the skills, 84% reported that they had tried using them in their life outside of Roca. Act On Your Values was the most commonly used skill (reported by 66% of respondents), followed by Be Present (64%) and Flex Your Thinking (64%) (see Table 3.3.3-1). Use of Move It and Act On Your Values differed significantly by site ($p < .01$) such that a smaller proportion of respondents from Boston reported using that skill than respondents from other sites, particularly Baltimore. No differences emerged between respondents who were eligible prior to COVID-19 and those who became eligible during COVID-19.

Table 3.3.3-1. Percentage of Participants who Said They Used Each CBT Skill, Overall and By Site

CBT Skill	Overall %	Boston %	Chelsea %	Springfield %	Baltimore %
<i>Be Present</i>	64.45%	60.61%	67.31%	61.67%	67.69%
<i>Label Your Feelings</i>	54.98%	54.55%	61.54%	53.33%	52.31%
<i>Move It</i>	48.82%	24.24%	44.23%	56.67%	58.46%
<i>Act On Your Values</i>	66.35%	42.42%	67.31%	68.33%	76.92%
<i>Stick With It</i>	50.24%	33.33%	50.00%	55.00%	55.38%
<i>Flex Your Thinking</i>	63.51%	45.45%	67.31%	65.00%	67.69%
<i>Solve It</i>	48.34%	33.33%	57.69%	50.00%	47.69%

Respondents also indicated which single skill they used most often: Act On Your Values was the most frequently used skill (27%), followed by Be Present (22%) and Flex Your Thinking (22%). Other skills were named by less than 10% of respondents as the most frequently used skill. There were no differences by site or eligibility date in terms of which skill was used most often. As a follow-up question, respondents were asked why they used their chosen skill most often: 33% said it was the easiest to use, 27% said they could relate to it, 22% said it was easiest to understand, 13% said they had more practice with it, and 5% said there was some other reason. There were no differences by site, but there was a significant difference by eligibility date ($p < .05$) such that respondents who became eligible during COVID-19 were more likely to state that their preferred skill was easier to use (53% versus 29%) and less likely to state that they can relate to it (14% versus 30%), that they had more practice with that skill (8% versus 14%), or for some other reason (0% versus 6%).

The survey also asked how helpful the skills are for dealing with situations in their lives: 70% of respondents said that the skills were very helpful and 23% said they were kind of helpful. Five percent were neutral, and less than 2.5% found the skills not very helpful or very unhelpful. There were no significant differences by site or eligibility date.

When respondents were asked to select among various situations for which they had used the skills to cope, violence was the most commonly selected situation (67%), followed by relationship problems (59%), job loss (50%), educational setbacks (38%), the COVID-19 pandemic (35%), and childcare issues (23%). Childcare issues were significantly ($p < .05$) more frequently indicated among respondents in Boston (30%) and Baltimore (32%) than in Chelsea (13%) and Springfield (17%).

3.3.3.2 Regression Analyses

We performed regression analyses to explore the association between respondents' engagement with CBT skills and several outcomes as measured by the survey data, including employment, participation in classes or training outside of Roca, engagement in risky thoughts and behaviors, and use of specific CBT skills. We used "have you ever done CBT with Roca" and "about how often does your YW talk about CBT or CBT skills with you?" (more than once a week, around once a week, around once a month, and less than once a month) as our predictor variables.

To test the relationship between CBT engagement and employment, we first ran bivariate regressions between the CBT engagement variable (ever done or how often), then added employment prior to Roca engagement as a covariate, followed by site and whether eligibility date was pre-COVID-19 or during COVID-19, and finally adding age at eligibility and race/ethnicity. In the bivariate model, ever having received CBT was positively associated with employment ($p < .05$); this association held when pre-Roca employment was added to the model ($p < .05$), but it was not significant in the model that added site and eligibility date (pre- or during COVID) or the one with age and race/ethnicity added in as well. These findings suggest that site, eligibility date, race/ethnicity, and/or age are more likely responsible for the observed associations than engagement with CBT. There was no significant association between frequency of CBT engagement and employment in any of those models.

Next, we looked at respondents' reported classes or training outside of Roca. Response options to this question included school, GED/HiSET prep, vocational training, and some other kind of education or training. As with employment, after running a bivariate model, we controlled for pre-Roca classes or training before adding the other covariates to the model. There was a positive association between ever having tried CBT and being in school in the base model ($p < .001$); this association remained significant when pre-Roca education was added ($p < .001$), and in the model controlling for site and eligibility date ($p < .05$). However, the association was not significant in the model that controlled for age and race/ethnicity. Again, it may be that demographic factors better predict who will take classes or other training outside of Roca. There was no significant association between frequency of CBT engagement and classes or training in any of those models.

We next looked at the association between CBT engagement and a number of risky behaviors respondents may have engaged in. The survey asked respondents about whether, before coming to Roca, they had thought about doing something against the law, actually done something against the law, used drugs, done something as part of a gang, been violent, or spent time around people doing something against the law. If they indicated that they had, we then asked whether they had done (or thought about doing) that thing more, less, or about the same since coming to Roca. Among respondents who indicated that they had thought about doing something against the law before Roca, there was a negative association between the frequency of engagement with CBT and thinking more about doing something against the law since coming to Roca; in other words, respondents who reported thinking *more* about doing something against the law did CBT *less* often. This finding was true in the base model ($p < .01$), the model that included site and eligibility date as covariates ($p < .05$) and in the full model (i.e., the one with all of the covariates included; $p < .05$). Similarly, respondents who had ever tried CBT were more likely to say they did something against the law *less* since engaging with Roca. This finding was true in the base model ($p < .001$), the model that included site and eligibility date ($p < .01$), and the full model ($p < .01$). Respondents who engaged with CBT more frequently were also more likely to use drugs less often since

SECTION 3: FINDINGS

coming to Roca than those who had never tried CBT; this association was significant only in the full model ($p < .05$). There were no significant associations between ever having done CBT and gang activity, violence, or spending time with other people engaging in illegal activities. Generally speaking, these analyses suggest that there is some association between engagement with CBT and positive outcomes, but that other factors, such as site, whether the respondent was engaged with Roca pre- or during COVID, age, and race/ethnicity, help to explain some of the relationships we found.

Finally, we looked at the association between frequency of CBT and use of specific CBT skills, but there were no significant associations.

4. Discussion

4.1 Summary of Key Findings

4.1.1 Fidelity Assessment (RQ1 & RQ2)

Our assessment of fidelity to the CBT curriculum as designed for Roca was framed by the “What does delivering CBT at Roca look like?” section of the Re-Wire CBT Skills Manual Introduction:

Formal Practice:

8. Establishing rapport with the individual.
9. Checking in on emotional and behavioral experiences in the past week (tracked weekly).
10. Checking in on problems that may have come up in the past week that the individual wants to focus on in class.
11. Review of skills practice in the past week.
12. Or, identifying a recent situation where the individual wished they had used a skill.
13. Teaching (or reviewing) a new skill.
14. Assign skill to practice over the next week.

Informal Practice:

4. Modeling of CBT skills, fostering a therapeutic environment.
5. Daily interactions with young people are goal-oriented.
6. Capitalizing on “teaching moments.”

4.1.1.1 Degree of CBT Implementation

- Roca participants received an average of 1.24 CBT-related Youth Worker contacts per month and attended an average of 1.03 CBT-related programs. Of Youth Worker contacts that contained CBT, conversational CBT was the most common type documented (0.74/month) followed by informal with visuals (0.41/month) and then formal (0.18/month). Almost a quarter of all Youth Worker contacts and programming documented in ETO involved CBT.
- CBT engagement varied substantially by site. Participants in Boston received more CBT-related Youth Worker contacts than participants at other sites, with an average of 2.0 CBT contacts per month at the Boston site compared to 0.64 per month at the Chelsea site. Young men at the Baltimore and Springfield sites more frequently attended CBT programming than those at the Boston and Chelsea sites. Boston and Baltimore had the highest average monthly occurrences of CBT training and the highest rates of Roca activities that included CBT. However, training for participants in Baltimore incorporated the least number of CBT skills of all the sites.
- Skills 1 (Be Present), 4 (Act On Your Values), and 5 (Stick With It) were the most commonly practiced skills during both types of engagement. Skill 7 (Solve It) was the least practiced skill during both Youth Worker contacts and programming. All skills are slightly more likely to be practiced during Youth Worker contacts than programming.

- Roca participants with higher number of arrests were more likely to review fewer CBT skills during their time at Roca and prior history of drug use or sales was associated with a higher rate of CBT programming over all programming.
- Overall, Roca participants who received housing assistance, healthcare assistance, food assistance, welfare, or other public assistance were more likely to review a higher number of CBT skills during their time at Roca. For Roca participants receiving welfare, this trend persisted across other measures of CBT engagement. Receiving welfare was also associated with a higher monthly rate of Youth Worker CBT contacts and a higher monthly rate of CBT program attendance.
- Roca participants who were younger at eligibility had a slightly lower rate of CBT programming over all programming. Participants with a high school degree or GED had a slightly higher rate of CBT programming over all programming.

4.1.1.2 Implementation of and Fidelity to Formal Practice of CBT

- We observed high levels of fidelity to the formal components of CBT as outlined in the skills manual:
 1. **Establishing rapport with the individual.** Establishing rapport is embedded throughout Roca’s model and foundational to their overall approach.
 2. **Checking in on emotional and behavioral experiences in the past week (tracked weekly).** Checking in with young men about current and past experiences is also embedded in the Roca model and often captured during Relentless Outreach and when building Transformational Relationships.
 3. **Checking in on problems that may have come up in the past week that the individual wants to focus on in class.** Staff consistently identified a focus of class, but not necessarily specific to problems experienced by young men in the past week. In fact, staff often used current experiences as the focus of class. When doing so, Roca participants were observed to be more engaged in comparison to when the examples provided by the formal materials (skills manual, PowerPoint) were used.
 4. **Review of skills practiced in the past week.** During our observations, past skills were reviewed, but not specifically those taught in the past week. It may be difficult to review the specific skills taught the previous week since the young men often take different classes from each other.
 5. **Or, identifying a recent situation where the individual wished they had used a skill.** Youth Workers were observed identifying a recent situation where the individual wish they used a skill when it was difficult for the Roca participant to come up with a focus for class.
 6. **Teaching (or reviewing) a new skill.** Teaching or reviewing a new skill was the most consistently observed focus of formal CBT practice. Staff often selected the skill to teach or review based on its application to a current situation. The skills we observed most often were “Be Present” and “Act on Your Values”.
 7. **Assign skill to practice over the next week.** We often observed staff assigning specific tasks related to a skill.
- We did observe some variation in how the formal practice of CBT was implemented, including the format of the CBT lesson (e.g., individual or group setting; location), the staff person

conducting a formal CBT lesson (e.g., availability, comfort and competency with the material), the time spent delivering a formal lesson (impacted by participant engagement and availability), and the mode of administration of the lesson material (e.g., worksheets, skill cards, PowerPoint slides).

4.1.1.3 *Implementation of and Fidelity to Informal Practice of CBT*

- During our observations we also frequently observed informal components of CBT being implemented across sites following the structure detailed in the skills manual:
 1. **Modeling of CBT skills.** CBT was often observed to be infused naturally in conversation. Staff stressed that they need to figure out what CBT skills they can use themselves to help them use the skills with the young men. During our observations, staff often discussed skills they had been working on themselves with other staff members. Staff were also often observed enforcing the language of CBT with the young men, such as discussing a cycle the staff was currently in. One staff member stated, “If we don’t break our own cycle, we won’t be able to break their cycle.”
 2. **Fostering a therapeutic environment.** Fostering a therapeutic environment is foundational to Roca’s model and was a component of the model prior to the introduction of CBT. Staff were often observed fostering a therapeutic environment in various aspects of programming and conversations. Fostering a therapeutic environment and remaining non-judgmental created a positive and welcoming environment that enabled young men to feel comfortable opening-up about what was happening in their lives.
 3. **Daily interactions with young people are goal-oriented.** We observed many interactions with young men that were goal-oriented, however this did not necessarily occur daily because frequency depended on to the number of contacts made with the specific young man (i.e., Youth Workers did not necessarily interact with the young men on their caseloads on a daily basis). Goal-setting was often infused into conversations when Youth Workers were discussing skills with the young men. For example, one Youth Worker asked a young man how he could “stick with” going to school and they set the goal to go to bed earlier.
 4. **Capitalizing on “teaching moments.”** The ability for staff to capitalize on “teaching moments” was facilitated when a therapeutic environment had been established. Staff members were observed to be presented with opportunities to tie in a CBT skill or reinforce CBT language (e.g., cycles, think-feel-do) when the young men felt comfortable opening-up about what was happening in their lives. Additionally, staff who were well versed in the CBT curriculum were able to naturally infuse CBT into conversations which allowed them to capitalize on teaching moments.

4.1.1.4 *Self-Reported Participant Use of and Satisfaction with CBT*

- More than three quarters of respondents (76%) stated that they had ever done CBT skills with Roca. The most commonly discussed skills were Be Present (77%), Flex Your Thinking (77%), and Act On Your Values (76%), followed by Label Your Feelings (72%), Stick With It (66%), Solve It (63%), and Move It (62%).
- Overall, respondents indicated that they were very satisfied with the CBT skills: on a scale from 1 to 5, with 5 being the highest rating, each of the seven skills received an average rating of at least 4. The Flex Your Thinking skill was highest rated (4.29), followed by Act On Your Values (4.24), Solve It (4.23), and Stick With It (4.22). There was a significant difference by site for Act On Your Values ($p < .05$) such that Boston respondents rated the skill lower than respondents from other sites.

4.1.2 Impact Analysis (RQ3)

4.1.2.1 Primary Analysis: Descriptive Dosage Analysis

- Early CBT was strongly related to later engagement with Roca and higher probabilities of employment and was related to lower probability of later arrest.
 - For each additional monthly CBT Youth Worker contact in the first three months of engagement with Roca, participants attended an average of 0.97 more programs per month after those first three months.
 - Increases in the number of different CBT skills reviewed increased the probability of both TEP and unsubsidized employment. Increased monthly CBT programming attendance increased the probability of TEP but decreased the probability of unsubsidized employment.
 - Increased monthly CBT programming attendance decreased the probability of an arrest for any offense.
 - After controlling for Roca participant characteristics, these relationships remained the same, except early Monthly CBT Youth Worker contact had a positive effect on TEP.
- The effect of greater levels of CBT was relatively consistent across Roca participant characteristics, with only a few factors that showed a significant interaction effect:
 - Past trauma had inconsistent effects on the impact of CBT.
 - Current drug use or sales and having a high school degree or equivalent increased the effectiveness of CBT.
 - Gang membership and being a parent or an expectant parent reduced the effectiveness of CBT.

4.1.2.2 Secondary Analysis: Quasi-Experimental Dosage Analysis

- Again, the most notable impact of early CBT at Roca is on later engagement with Roca's overall programming.
 - Roca participants who received more than 5 CBT skills in their first three months a Roca, have a 26% higher contact success rate during later months when compared to Roca participants who receive fewer CBT skills.
 - Roca participants who received an above average level of monthly CBT Youth Worker contacts in their first three months attended 3.75 more classes per month in later months than participants who received fewer CBT contacts.
- CBT also had an impact on TEP.
 - For TEP enrollment, the number of CBT skills and meeting CBT guidelines standards both increased the probability of obtaining enrollment in TEP.
- Receipt of CBT that met at least one measure of Roca high dosage guidelines (i.e., CBT contacts of 8 or greater per month, CBT programming of 4 or greater per month, and receipt of all 7 skills) was linked to a reduced time to TEP enrollment.

4.1.2.3 Impact of CBT on Participant Outcomes - Survey Sample

- Of the respondents who said they had learned about any of the CBT skills at Roca, 86% stated that they felt ready to use them.
 - There was a significant difference by site ($p < .05$) such that respondents from Boston were less likely to say they felt ready to use the skills (69%) than respondents from other sites (87% in Chelsea, 91% in Springfield, and 90% in Baltimore).
 - Of those who said they were not ready to use the skills in their everyday lives or were not sure that they were ready, 51% said they needed more practice using the skills first.
- Of respondents who said they felt ready to use the skills, 84% reported that they had tried using them in their life outside of Roca.
 - Act On Your Values was the most commonly used skill (reported by 66% of respondents), followed by Be Present (64%) and Flex Your Thinking (64%).
 - Use of Move It and Act On Your Values differed significantly by site ($p < .01$) such that a smaller proportion of respondents from Boston reported using that skill than respondents from other sites, particularly Baltimore.
- When respondents were asked to select among various situations for which they had used the skills to cope, violence was the most commonly selected situation (67%), followed by relationship problems (59%), job loss (50%), educational setbacks (38%), the COVID-19 pandemic (35%), and childcare issues (23%).
 - Childcare issues were significantly ($p < .05$) more frequently indicated among respondents in Boston (30%) and Baltimore (32%) than in Chelsea (13%) and Springfield (17%).
- There was a negative association between the frequency of engagement with CBT and thinking about doing something against the law since coming to Roca; in other words, respondents who reported thinking *more* about doing something against the law before coming to Roca did CBT *less* often. This finding was true in the base model ($p < .01$), the model that included site and eligibility date as covariates ($p < .05$) and in the full model (i.e., the one with all of the covariates included; $p < .05$).
- Respondents who had ever tried CBT were more likely to say they did something against the law *less* since engaging with Roca. This finding was true in the base model ($p < .001$), the model that included site and eligibility date ($p < .01$), and the full model ($p < .01$).
- Respondents who engaged with CBT more frequently were also more likely than those who had never tried CBT to use drugs less often since coming to Roca; this association was significant only in the full model ($p < .05$).

4.1.3 The impact of COVID-19

- COVID-19 has affected Roca's programming, the economy, and the justice system. Despite the disruption caused by the pandemic, it does not change our general findings because it represents such a small portion of the overall timeframe for this evaluation.

4.2 Limitations

Per our contractual agreement with Roca, this evaluation did not include participants in the young mothers program. Such exclusions limit our ability to speak to Roca's intervention model beyond its model for young men.

Our evaluation included some limitations in our data collection methods. Our observations took place in 2019 so we did not observe any changes to Roca’s implementation of and fidelity to CBT as a result of the 2020 COVID-19 pandemic. Also in 2020, Roca also modified and enhanced the capacity and frequency of staff training in the CBT curriculum and added a new web-based platform that hosts the CBT curriculum materials as an additional resource for staff to access those materials. Our observations do not incorporate any reflections on these changes. Limitations related to the participant survey include response bias (a limitation common to surveys of hard-to-reach populations), which restricts our ability to generalize the survey findings to Roca participants in general. Finally, there are limitations with our analyses of administrative and program data. First, inconsistencies in data collection meant some potentially important measures (e.g., hours of programming) could not be used in our analyses. Second, although recidivism was a secondary outcome of interest, a larger sample or a longer follow-up window would have increased the potential to find an effect of CBT on such longer-term outcomes. Third, large amounts of missing data limited our ability to incorporate elements of Roca’s change assessment (e.g., motivation). The matching procedure would have been improved with a measure of motivation and components of the change assessment could also have provided alternate outcome measures. Fourth, matching/weighting with regression models was the most robust design possible, but these techniques can only adjust for selection on observable variables. If any unobserved factors influence CBT participation, our estimates are biased. Similarly, a randomized design would have been the ideal design, followed by non-experimental designs that better account for selection on unobservable factors like regression discontinuity or instrumental variables. However, these designs require a pattern regarding who gets CBT, as opposed to a blanket policy that everyone gets CBT, and so were not appropriate designs for this study. Finally, because we were examining high vs. low dosage levels of CBT (since everyone is supposed to get CBT), our findings may in fact understate the importance of CBT. A more accurate estimate of the impact of CBT would compare the receipt of any CBT to the receipt of no CBT.

It is also worth noting that although this evaluation was not directly impacted by the COVID-19 pandemic, interviews with site directors and some of the survey findings indicate that the impact on Roca’s operations and participants was significant and could have implications for the generalizability of the findings we report from this evaluation moving forward.

4.3 Recommendations and Future Directions

- Based on our findings from the fidelity assessment, we recommend that Roca add more detailed measures of CBT to ETO (e.g., format, mode of administration, time spent).
- Because the participant survey did not allow for nuanced discussion around participants’ experiences with CBT at Roca, we recommend exploring participants’ use of and satisfaction with specific skills in more detail, such as unpacking the reasons that some of the skills are used less often.
- Regarding the formal elements of CBT, we recommend either ensuring alignment of timing expectations with actual frequency of Youth Worker contact and programming with participants (e.g., participants may not be taking classes every week), or removing the timing requirement for each element from the manual.
- Given our observation that staff who were more comfortable with the CBT materials seemed to be better at infusing CBT into their interactions and promoting buy-in from the participants, we recommend continued encouragement and enforcement of staff use of CBT to promote their comfort and competence with the material.
- Regarding the teaching or reviewing of skills, we observed varying degrees of buy-in and resistance for each of the modes of administration of the material (e.g., worksheets, skill cards,

SECTION 4: DISCUSSION

PowerPoint slides). We recommend that Roca consider the various modes of administration and provide guidance to staff on when, how, and with whom to use the various materials.

- We observed that elements of Roca’s CBT curriculum directly overlap with elements of Roca’s overarching model and approach (e.g., establishing rapport, fostering therapeutic environment). To isolate the impact of CBT, we recommend keeping the two distinct.
- Given some of the challenges with data completeness, we recommend that Roca ensure Youth Workers and educators consistently update ETO, incorporate workflows to facilitate regular data entry, and stressing the importance of good data reporting to accurately assess outcomes.
- Participant motivation is likely a significant driver of impact that was not accounted for in our study. We recommend that Roca collect regular change assessments, particularly at the time of eligibility or soon after.
- For more precise testing of the impact of CBT or other aspects of Roca’s model, we recommend considering other evaluation designs to help isolate the impact, such as randomized or phased enrollment.

Appendix A. Data Collection Protocols

A.1 Formal and Informal CBT Observation Protocols

A.1.1 Roca Formal CBT Implementation Observation Protocol

Location: _____

CBT Lesson: _____

Youth Worker: _____

Observer: _____ **Date:** _____

In addition to the checklists below, please use the CBT Skill Checklist to assess the youth worker’s fidelity to the agenda.

Youth Worker Formal Practice:	Yes	No	To some extent/explain
1. Youth worker asks the class about their emotional and behavioral experiences in the past week.			
2. Youth worker asks the class about problems that have occurred in the past week that they want to focus on in class.			
3. Youth worker reviews the skill practiced in the past week.			
4. Optional: Youth worker identifies a recent situation where the individual wishes they had used a CBT skill.			
5. Youth worker teaches or reviews a new CBT skill.			
6. Youth worker hands out the worksheet associated with the CBT skill and reviews it with the class after the youth have completed it.			
7. Youth worker assigns a CBT skill to practice over the next week.			

Notes/Additional Observations:			
Youth Worker Behavior:	Yes	No	To some extent/explain
<p>1. Youth worker is highly competent in CBT curriculum.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> Youth worker may read off the slides, but is clearly well-versed in the teaching points. Youth worker demonstrates their comfort with the material by applying the skills to situations not in the slides' examples. 			
<p>2. Youth worker adeptly responds to the youth's questions and comments.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> Youth worker actively listens to the youth. Youth worker infuses CBT content into their responses (i.e. draws Think-Feel-Do bubbles about a youth's situation). 			
<p>3. Youth worker capitalizes on "teaching moments" and meets youth where they're at.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> In "Act on Your Values," the youth worker uses the youths' current values to encourage intentional behavior. In "Be Present," the youth worker alters the initial exercise to best fit that particular class. 			
<p>4. Youth worker knows when to curtail unproductive behavior.</p> <p><i>Example:</i></p>			

<ul style="list-style-type: none"> • In “Label Your Feelings,” the youth worker may try to limit youth from ruminating about painful feelings because it will cause ‘spinning’ in an unproductive cycle. • In “Label Your Feelings,” the youth worker discourages youth from stating that they do not have feelings, or making statements that do not describe a feeling. 			
<p>5. Youth worker is <i>not</i> judgmental of youth’s responses.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Youth worker does not frame situations as “good or bad” or “positive or negative.” • Youth worker has a positive attitude and is encouraging. • Youth worker does not make assumptions, but rather asks clarifying questions. 			
<p>Notes/Additional Observations:</p>			

Youth Behavior:	Yes	No	To some extent/explain
<p>1. Youth are engaged in the lesson.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Youth are attentive to the youth worker (i.e. <i>not</i> talking during the lesson, <i>not</i> on their cell phones). • Youth respond to the youth worker’s questions. • Youth participate in the activities/worksheets. 			
<p>2. Youth understand the lesson.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> • Youth understand the language & content of the slides. 			

<ul style="list-style-type: none"> Youth ask clarifying questions that illustrate they are following the general points of lessons. 			
<p>3. Youth relate to and have a positive attitude towards the curriculum.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> Youth reply thoughtfully to the youth worker's questions. Youth use personal examples when completing the activities/worksheets. 			
<p>4. Youth trust the youth workers as a pillar of support.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> Youth ask the youth workers for help or advice. Youth do <i>not</i> make fun of youth workers to other youth. 			
<p>Notes/Additional Observations:</p>			

A.1.2 Roca Informal CBT Implementation Observation Protocol

Location: _____

Formal Program? If yes, what program? _____

Informal Conversation? If yes, between whom? _____

Topic Discussed (Check all that apply): Family _____ Friends _____ Disputes _____
 Alcohol/Drugs _____ Legal Issues _____ Work _____ Education _____ Finances _____
 Relationships _____ Other (please describe) _____

Observer: _____ **Date:** _____

General Staff Behavior:	Yes	No	To some extent/explain
--------------------------------	------------	-----------	-------------------------------

<p>1. Staff is highly competent in the CBT curriculum.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Staff have a clear understanding of the CBT skills being discussed. • Staff can tailor the CBT objectives to an individual youth. 			
<p>2. Staff models the CBT skills.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Staff naturally infuses CBT into non-CBT programming. 			
<p>3. Staff engages in goal-oriented interactions with the youth.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Staff “assigns” youth to practice specific CBT skills throughout the day or week and report back. 			
<p>4. Staff is <i>not</i> judgmental of youth.</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • Staff does not frame situations as “good or bad” or “positive and negative.” • Staff has a positive attitude and is encouraging. • Staff asks clarifying questions, rather than making assumptions. 			
<p>5. Staff capitalizes on “teaching moments.”</p> <p><i>Example:</i></p> <ul style="list-style-type: none"> • If youth describes an unproductive thought/feeling/action, the staff responds by discussing how CBT can help. 			
<p>Notes/Additional Observations:</p>			

Youth Behavior:	Yes	No	To some extent/explain
<p>5. Youth are engaged when the staff models CBT skills.</p>			

<p><i>Examples:</i></p> <ul style="list-style-type: none"> Youth are attentive to the staff (i.e. <i>not</i> talking over the staff, <i>not</i> on their cell phones). Youth respond to the staff's questions. 			
<p>6. Youth are receptive to the CBT material.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> Youth ask clarifying questions that illustrate they understand the staff's point. Youth consider how to apply a CBT skill to their own situation. 			
<p>7. Youth trust the staff as a pillar of support.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> Youth ask the staff for help or advice. Youth do <i>not</i> make fun of staff to other youth. 			
<p>Notes/Additional Observations:</p>			

Questions for Youth Workers

1. How confident are you in teaching the CBT curriculum?
2. How satisfied are you with the CBT curriculum? What has worked well and what would you improve?
3. How satisfied are you with how Roca implements the CBT curriculum? What has worked well and what would you improve?
 - a. How knowledgeable are staff members about the CBT curriculum?
4. Have youth liked the CBT curriculum? Do they think it is helpful?
 - a. Do you think that certain skills are received better than others? How come?

- b. Do you think that youth prefer learning about CBT through lessons or informal interactions?
 - c. Do you think CBT works better for some youth than others? If so, why? What makes youth more or less receptive to the curriculum?
5. Do you think that the youth has adopted and used the CBT principles? If not, how come? What might increase the uptake?

A.2 Roca Participant Survey

Please enter the ID: _____

(Echo back the number for confirmation.)

S1. Are your initials: *[DISPLAY: INITIALS]*?

Yes (*Continue*)

No (*exit & go to screen out message*)

Screen out message : The information you have provided does not match our records. If you think you entered something incorrectly, please re-enter the survey link and try again. If you think our records are incorrect, please contact your counselor."

S2. Please enter your date of birth.

_____ (*Mask to match sample format*)

S3. To ensure you entered it correctly, please enter your date of birth again.

_____ (*Mask to match sample format*)

If S3 does not match S2, ask S2 again.

(PROGRAMMER: If DOB matches sample, continue.

If DOB does not match sample, exit and go to screen out message.)

Screen out message : The information you have provided does not match our records. If you think you entered something incorrectly, please re-enter the survey link and try again. If you think our records are incorrect, please contact your counselor."

(PROGRAMMER: ALLOW R to skip a question without a response. Provide 1 error message and then continue without a response.)

(If a question is skipped, auto mark that question to REFUSED.)

Welcome to the Roca Youth Survey.

What is this about?

Roca asked us to study Roca's programming. We work at a company called Abt Associates. People at Abt study lots of different topics, like employment, education, and criminal justice. For the Roca study, we would like to learn about the young men who get programming from Roca. We would like to know about how you got connected to Roca, what you do there, and what you like and do not like about Roca.

What am I being asked to do?

We would like you to answer questions in a survey about your experience with Roca. If you decide to take the survey, you will get a \$20 gift card. We hope that you will take this survey. Your answers could help make Roca's programming better. But, you do not have to take the survey if you do not want to. You can stop answering questions at any time and you do not have to answer any questions that you do not want to answer. Taking the survey – or not taking the survey – will not change your relationship with Roca in any way.

What will you do with my answers?

Abt will combine everyone's answers to the questions and write a report to Roca. We will link your responses with Roca's data and criminal justice data. We will not tell Roca what you say; we will only tell them a combination of what everyone says. Only the Abt study team will see your answers, and we will not share them with anyone else. The only reason we would ever need to share your answers is if you say you are going to hurt yourself or someone else – but we will not ask you about this. We will not tell Roca anything about you or your answers.

Will there be any risk to me if I take the survey?

We do not think there will be any risk to you if you take the survey. There is a small chance that your answers could get lost or stolen. We will do everything we can to prevent this from happening.

Who can I call with questions?

If you have any questions, you can send an email to the Project Director, Holly Swan, at Holly_Swan@abtassoc.com. If you have questions about your rights as a participant, you can call Abt's Institutional Review Board (IRB) at 1-877-520-6835 or send them an email at IRB@abtassoc.com. All contact with the IRB will be private.

Do you want to take the survey?

- Yes
- No (***TERMINATE INTERVIEW – REFUSED CONSENT***)

(PROGRAMMER: NEW SCREEN)

Before you begin, a few important reminders:

- To move through the survey, please use the next and back buttons in the survey, not the forward or back button on the browser.

- If you can't finish the survey, your place in the survey will be saved if you close the page. When you are ready to return, please click on the link contained in the email or go to www.abtsurvey.com/roca and enter your ID number again. When you start again, you will be able to continue where you left off.
- If you do not want to answer a question, simply hit the next button and the survey will continue.

Let's begin.

A. Which Roca site does your Youth Worker work out of?

- Lynn
- Boston
- Chelsea
- Springfield
- Holyoke
- Baltimore

(ASK ALL)

1. How long has it been since you met your first Youth Worker?
- I just met them this week
 - I met them a week or two ago
 - I met them about a month ago
 - I met them more than a month ago, but it's been less than a year
 - I met them about a year ago
 - It's been a couple years since I met them

(ASK ALL)

2a. How did you first get started with Roca? (SINGLE SELECT)

- A judge mandated it **(SKIP TO Q2B)**
- I was referred to Roca **(ask 2a1)**
- A Youth Worker approached me **(SKIP TO Q2B)**
- I walked in on my own **(ask 2a2)**
- Another way (how?): _____ **(SKIP TO Q2B)**

(ASK 2A1 and 2A1A if 2A=2)

2a1. Who referred you to Roca?

- My probation or parole officer
- My friend
- My girlfriend/partner/wife
- Someone from my family (mom, brother, aunt, cousin)
- A Roca Youth Worker
- My counselor or social worker

- Someone else (who?) _____

2a1a. Why do you think you were referred to Roca? (*Check all that apply*)

- I needed help finding a job, doing a resume or looking for job training programs
- I had friends at Roca
- I needed legal help
- I needed counseling
- I needed shelter or housing
- I needed clothing or food
- I needed a safe place to hang out
- I needed help with a court case
- I needed services for my kids
- I needed help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Filing for unemployment
 - Other (please specify): _____
- I needed something else (please specify): _____
- I don't know

CATI NOTE: IF ENROLLMENT DATE IS MARCH 15TH OR AFTER THAT DATE, GO TO 2a1a1. If enrollment date is before March 15th, then skip to 2a2 logic.

2a1a1. Which, if any, of these did you need assistance with because of COVID-19 pandemic?

- I needed help finding a job, doing a resume or looking for job training programs
- I had friends at Roca
- I needed legal help
- I needed counseling
- I needed shelter or housing
- I needed clothing or food
- I needed a safe place to hang out
- I needed help with a court case
- I needed services for my kids
- I needed help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Filing for unemployment
 - Other (specify) _____
- I needed something else (please specify) _____
- I don't know
- None of these

GOTO Q2B

(ASK 2A2 if 2A=4)

2a2. Why did you decide to walk in on your own? (Check all that apply)

- I needed help finding a job, doing a resume or looking for job training programs
- I had friends at Roca
- I needed legal help
- I needed counseling
- I needed shelter or housing
- I needed clothing or food
- I needed a safe place to hang out
- I needed help with a court case
- I needed services for my kids
- I needed help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Filing for unemployment
 - Other (specify)_____
- I wanted to talk to someone
- I needed something else (please specify)_____
- I don't know

CATI NOTE: IF ENROLLMENT DATE IS MARCH 15TH OR AFTER THAT DATE, GO TO 2a2a. If enrollment date is before March 15th, then skip to 2b.

2a2a. Which, if any, of these did you need assistance with because of COVID-19 pandemic?

- I needed help finding a job, doing a resume or looking for job training programs
- I had friends at Roca
- I needed legal help
- I needed counseling
- I needed shelter or housing
- I needed clothing or food
- I needed a safe place to hang out
- I needed help with a court case
- I needed services for my kids
- I needed help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Filing for unemployment
 - Other (specify)_____
- I wanted to talk to someone
- I needed something else (please specify)_____
- I don't know
- None of the these

(ASK ALL)

2b. Why do you engage with Roca **now**? (Check all that apply)

- I trust my Youth Worker
- I feel safe with Roca
- My Youth Worker keeps me engaged
- I need help finding a job, doing a resume or looking for job training programs
- I have friends at Roca
- I have to come to Roca because a judge, DA, or probation officer says I have to
- I need clothing or food
- I want to talk to someone
- I want counseling
- I want help finding housing or shelter
- I need help with a court case
- I want services for my kids
- I need help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Housing
 - Filing for unemployment
 - Other (please specify): _____
- I want something else (please specify): _____

CATI: If 2b = “I trust my Youth Worker”, “I feel safe with Roca”, and/or “My Youth Worker keeps me engaged” and not any other options, then skip to Q3.

2b1. Which, of any, of these do you need assistance with **now** because of COVID-19 pandemic?
(Check all that apply – display only those selected in 2b)

- I need help finding a job, doing a resume or looking for job training programs
- I have friends at Roca
- I have to come to Roca because a judge, DA, or probation officer says I have to
- I need clothing or food
- I want to talk to someone
- I want counseling
- I want help finding housing or shelter
- I need help with a court case
- I want services for my kids
- I needed help with:
 - TANF (welfare)
 - SNAP (food stamps)
 - Medicaid
 - Housing
 - Filing for unemployment
 - Other (specify)_____
- I wanted something else (please specify)_____

- None of these

(ASK ALL)

3. Since you first met your Youth Worker, have you ever stopped engaging with Roca?

- Yes (**ask 3a**)
- No (**skip to 4a**)

(ASK 3A if 3=1)

3a. Why have you stopped engaging with Roca? (*Check all that apply*)

- I got arrested
- I got incarcerated
- I got annoyed with my Youth Worker
- I did not like Roca
- I moved to a different town
- I had issues with another Roca participant
- I was in treatment
- I was using alcohol or drugs
- I had a medical issue
- I did not feel safe at Roca
- I did not like some changes they made in response to COVID-19
- Other (please specify): _____

(ASK ALL)

<p>4a. What kinds of things have you EVER done with Roca? (<i>Check all that apply</i>)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Vocational classes (e.g., woodshop, OSHA, Forklift) <input type="checkbox"/> Work Crew/Transitional Employment Programming (TEP) <input type="checkbox"/> Educational programming: Hi-SET/GED prep <input type="checkbox"/> Educational programming: Other (please specify):_____ <input type="checkbox"/> Healthy Habits/substance use class <input type="checkbox"/> Work Force Readiness (WFR) class <input type="checkbox"/> Cognitive behavioral theory (CBT) <input type="checkbox"/> Core Circle <input type="checkbox"/> Community Dinner <input type="checkbox"/> Counseling <input type="checkbox"/> Culinary <input type="checkbox"/> Art class <input type="checkbox"/> Studio <input type="checkbox"/> Exercise/work out/play sports
--

- Help getting housing
- Help getting a job (e.g., resume help, mock interviews)
- Help getting benefits (e.g., SNAP/food stamps, TANF/welfare)
- Help getting permit/license
- Meet with Youth Worker
- Ate a meal
- Just hang out
- Other (please specify): _____

Satisfaction with Roca

(ASK ALL)

5. Overall, how helpful is Roca to you?

- Very helpful
- Somewhat helpful
- Not very helpful
- Not at all helpful

(ASK ALL)

5a. In a few words, please give reasons why you think Roca is (ANSWER TO Q5).

(ASK ALL)

6. Please say how much you agree with each sentence about Roca, on a scale from 1 to 5, where 1=strongly disagree, 3 = neither agree nor disagree, 5 = strongly agree, and N/A means this statement doesn't apply to you.

	Choose your rating below. (1= strongly disagree 5=strongly agree)					
My Youth Worker explains everything to me in a way that is easy to understand.	1	2	3	4	5	N/A
My Youth Worker listens carefully to me.	1	2	3	4	5	N/A
My Youth Worker and the other Roca staff work well together to address my needs.	1	2	3	4	5	N/A
My Youth Worker gives me information and resources that help me make safe choices.	1	2	3	4	5	N/A

My Youth Worker spends enough time with me.	1	2	3	4	5	N/A
I have a strong and trustworthy relationship with my Youth Worker.	1	2	3	4	5	N/A
My Youth Worker treats me with respect when we're at Roca.	1	2	3	4	5	N/A
My Youth Worker treats me with respect when we're in my neighborhood or at my house.	1	2	3	4	5	N/A
Other Roca staff (e.g., directors, crew supervisor, educator) treats me with respect.	1	2	3	4	5	N/A
Before COVID-19, I felt safe at the Roca building.	1	2	3	4	5	N/A
I feel safe with my Youth Worker.	1	2	3	4	5	N/A
I feel safe with other Roca staff.	1	2	3	4	5	N/A
Roca did a good job responding to the COVID-19 pandemic	1	2	3	4	5	N/A

(ASK ALL)

7. How could Roca be better? *This could include suggestions to improve the services available, how Roca runs, how you are treated, how Roca responded to the COVID-19 pandemic, or anything else that comes to mind.*

This part of the survey asks about Cognitive Behavioral Theory (CBT) at Roca.

Roca uses CBT to help you with your thoughts, feelings, and behaviors. CBT is also meant to help you think about how your thoughts, feelings, and behaviors affect each other.

(ASK ALL)

8. Do you know about Roca's CBT skills?

- Yes **(ask 8a)**
- No **(skip to 13a)**
- Not sure **(skip to 13a)**

(ASK 8a if 8=1)

8a. Have you ever done CBT with Roca? *(Check all that apply)*

- Yes, I've had a class with a worksheet
- Yes, my Youth Worker talked to me about skills to use in different situations
- Yes, my Youth Worker used key cards with me
- No
- Not sure

(ASK 9 if 8=1)

9. How much do you like the CBT skills that you have learned about, on a scale from 1 to 5, where 1= I didn't like it at all, 3 = neither liked nor disliked, and 5 = I liked it a lot.

	Choose your rating below. (1= didn't like it at all 5=liked it a lot)					
Be Present	1	2	3	4	5	I have not learned about this skill
Label Your Feelings	1	2	3	4	5	I have not learned about this skill
Move It	1	2	3	4	5	I have not learned about this skill
Act On Your Values	1	2	3	4	5	I have not learned about this skill
Stick With It	1	2	3	4	5	I have not learned about this skill
Flex Your Thinking	1	2	3	4	5	I have not learned about this skill
Solve It	1	2	3	4	5	I have not learned about this skill

(ASK 10 if 8=1)

10. Does your Youth Worker talk about CBT or CBT Skills with you?

- Yes (*ask 10a*)
- No (*skip to 11*)
- Not sure (*skip to 11*)

(ASK 10a and 10b if 10=1)

10a. About how often does your Youth Worker talk about CBT or CBT Skills with you?

- More than once a week
- Around once a week
- Around once a month
- Less than once a month

10b. Which skills has your Youth Worker talked to you about? (*Check all that apply*)

- Be Present
- Label Your Feelings
- Move It
- Act On Your Values
- Stick With It
- Flex Your Thinking
- Solve It

(ASK 11 if 8=1)

11. Do you feel ready to use the skills in your daily life?

- Yes **(SKIP TO 12)**
- No **(ask 11a)**
- Not sure **(ask 11a)**

(ASK 11a if 11=2 or 3)

11a. Do you think you need more practice using the skills?

- Yes
- No
- Not sure

(ASK 12 if 8=1)

12. Have you tried using CBT Skills in your life outside Roca?

- Yes **(ask 12a-12d)**
- No **(ask 13a)**
- Not sure **(ask 13a)**

(ASK 12a-12d if 12=1)

12a. Which CBT Skills have you tried using in your daily life outside of Roca? *(Check all that apply)*

- Be Present
- Label Your Feelings
- Move It
- Act On Your Values
- Stick With It
- Flex Your Thinking
- Solve It

(IF Q12A = only 1 response, automark Q12B with that response and continue)

12b. Which skill have you used most often? (SINGLE RESPONSE)

- Be Present

- Label Your Feelings
- Move It
- Act On Your Values
- Stick With It
- Flex Your Thinking
- Solve It

12b1. Why do you use this skill the most?

- It's easier to understand than the others
- It's easier to use in more situations
- I can relate to it more than the others
- I've had more practice with it than the others
- Other (please specify): _____

12c. How helpful are the CBT Skills for dealing with situations in your life?

- Very helpful
- Kind of helpful
- Not helpful, but not unhelpful
- Not very helpful
- Very unhelpful

12d. What kinds of situations do you use the CBT skills to cope with? (Check all that apply)

- Violence
- Job loss
- Educational setbacks
- Relationship problems
- Childcare issues
- The COVID-19 pandemic
- Other (please specify): _____
- None of these

(ASK ALL)

The remaining questions ask about how well Roca is working for you.

13a. In the past, have you ever: *(for all "Yes" answers at 13a, ask corresponding Q13b)*

	Yes	No
13a1. Thought about doing something against the law:	○	○
13a2. Done something against the law:	○	○
13a3. Used drugs or alcohol:	○	○
13a4. Done something as part of a gang:	○	○
13a5. Been violent:	○	○
13a6. Spent time with other people who were doing something against the law:	○	○

(ASK 13b for each yes at 13a)

13b. Since you've been involved with Roca, would you say you have:

	More often	Less often	Stayed the same
13b1. Thought about doing something against the law:	○	○	○
13b2. Done something against the law:	○	○	○
13b3. Used drugs or alcohol:	○	○	○
13b4. Done something as part of a gang:	○	○	○
13b5. Been violent:	○	○	○
13b6. Spent time with other people who were doing something against the law:	○	○	○

(ASK ALL)

14. What are some of the things you've done since you started with Roca? *(Check all that apply)*

- Finished a phase of the program
- Got a job
- Finished job training (e.g., Fork lift operating license; OSHA certification; Got ServSafe certified)
- Finished permit classes
- Obtained permit
- Finished educational classes
- Completed TEP
- Got a GED/Hi-SET
- Took programming classes (e.g., Workforce Readiness, CBT, Healthy Habits)
- Found positive role models and friends
- Started thinking about how my thoughts and feelings influence my behaviors
- Learned to identify when I get stuck spinning in a think- feel- do cycle
- Learned how to slow myself down and use a skill to think or do something different
- Started acting on my values
- Stayed out of jail
- None of these
- Other (please specify): _____

(ASK ALL)

15. Before coming to Roca, did you have a job for longer than three months?

- Yes *(ASK 15a1)*
- No *(SKIP TO 15a)*
- I had a job before but lost it because of the COVID-19 pandemic *(ASK 15a1)*

(ASK 15a1 if 15=1 or 3)

15a1. What was your job? _____

(ASK ALL)

15a. Right now, do you have a job that you've been in for longer than three months?

- Yes **(ASK 15b)**
- No **(SKIP TO 16)**
- I had a job before but lost it because of the COVID-19 pandemic **(ASK 15b)**

(ASK 15b if 15a=1 or 3)

15b. What is your job? _____

(ASK ALL)

16. Before coming to Roca, were you taking classes or other training somewhere else?

- Yes **(ASK 16a)**
- No **(SKIP TO 17)**
- I was taking classes or training before coming to Roca but had to stop because of the COVID-19 pandemic **(ASK 16a)**

(ASK 16a if 16=1 or 3)

16a. What school or program? _____

(ASK ALL)

17. Are you taking classes or other training somewhere other than Roca right now?

- Yes, in school
- Yes, GED/Hi-SET prep
- Yes, vocational training (please specify): _____
- Yes, other (please specify): _____
- I was, but I had to stop because of the COVID-19 pandemic
- No

(ASK ALL)

18. In addition to the help you get from Roca, in the past year have you gotten help from any of these agencies or people? *(Check all that apply)*

- A probation officer
- A parole officer
- A caseworker or social worker
- A substance abuse treatment clinic
- A behavioral health clinic
- A therapist or counselor
- Other (please specify): _____
- None of these

Thank you for taking the time to answer this survey. We will let your Youth Worker know that you completed the survey and they will contact you about getting your gift card within the next 7 days.

Appendix B. Codebook

Name	Description
CBT Framework	The Cognitive Behavioral Therapy (CBT) curriculum framework created and implemented by Roca
I_Overall approach	Observed indicator of references to Rocas overall CBT approach
I_Formal approach	Observed features of Rocas formal approach to CBT
Assign skill to practice	Observed indicator of formal programming element of assign skill to practice over the next week.
Establish rapport	Observed indicator of formal programming element of establishing rapport with the individual
Identify focus of class	Observed indicator of formal programming element of checking in on problems that may have come up in the past week that the individual wants to focus on in class
Identify situation wish used skill	Observed indicator of formal programming element of identifying a recent situation where the individual wished they had used a skill.
Past week check-in	Observed indicator of formal programming element of checking in on emotional and behavioral experiences in the past week (tracked weekly).
Review last week's skill	Observed indicator of formal programming element checking in on problems that may have come up in the past week that the individual wants to focus on in class.
Teach (or review) new skill	Observed indicator of formal programming element of teaching (or reviewing) a new skill.
I_Informal approach	Observed features of Rocas informal approach to CBT
Capitalizing on teaching moments	Observed indicator of informal programming element of capitalizing on "teaching moments"
Goal-oriented interactions	Observed indicator of informal programming element of daily interactions with young people are goal-oriented.

Name	Description
Modeling of CBT skills	Observed indicator of informal programming element of modeling CBT skills
Therapeutic environment	Observed indicator of informal programming element of fostering a therapeutic environment.
Language	Observed common CBT language used by Roca staff and youth such as spinning, stuck in a cycle, and circles
Think-Feel-Do Cycles	Observed references to "think-feel-do" cycles
Tool for Change	Observed Roca's CBT model referenced as a tool for change
CBT Model	The seven skills that make up Roca's CBT model
Act On Your Values	Skill focused on reducing emotion-driven behaviors
Be Present	Skill focused on mindfulness and acceptance
Flex Your Thinking	Skill focused on challenging unhelpful or inaccurate thoughts
Label Your Feelings	Skill focused on labelling emotions
Move It	Skill focused on increasing purposeful engagement in experiences
Solve It	Skill focused on problem-solving
Stick With It	Skill focused on reducing emotional and behavioral avoidance
Component of Roca observed	Component of the Roca model that was observed
CBT-specific programming	CBT observed being administered during CBT-specific programming
I_Award Ceremony	Observed component of CBT during Roca site award ceremony
I_Circle	Observed applications of CBT during circle
I_Development Day	Observed component of CBT during development day including staff meetings
I_Morning check-in	Observed applications of CBT during morning check-in
I_Supervision check-in	Observed applications of CBT during supervision check-in meetings

Name	Description
Non-CBT programming	CBT observed being administered during non-CBT programming such as workforce readiness, GED/HiSET, and pre-voc programs
Outreach	CBT observed being administered during outreach
Work Crew_TEP	CBT observed being administered during transitional employment programming (TEP) often referred to as work crew
COVID-19	Things that stand out that might be relevant to COVID-19 related model changes
I_Roca Model	Mentions of Roca's model not specific to CBT
I_Engaged institutions	Observed indicator of Rocas engaging with other institutions
I_Relentless Outreach	Observed indicator of Roca's relentless outreach
I_Staff Coordination	Observed indicator of coordination among Roca staff
I_Transformational Relationships	Observed indicator of importance of establishing trust and rapport when engaging in programming
I_Barrier	Observed indicator of something that hinders the relationship between youth and staff
I_Site level factors	Observed indicator of factors that influence each site differently
I_Building space	Observed indicator of the impact of building space on the operations of Roca including CBT
I_Community influence	Observed indicator of contextual factor of the community that influences how Roca operates at a site
I_Staff burnout	Observed indicator of staff burnout at site
I_Staff shortage	Observed indicator of staff turnover or shortage of staff
I_Technology	Observed indicator of the impact of technology on the operations of Roca including CBT
I_Timing	Inductive code created to capture an indicator of variations in the timing of applying CBT skills

Name	Description
Influence of Observers	Abt team influence on site observations
Leadership	Observations related to Roca Leadership (Director, Assistant Director, etc.) perceptions and use of CBT
Buy-in	Observed indicator of Leadership acceptance and support of Roca's CBT model including CBT principles, skills, and programming
Use_Implementation of CBT	Observed Leadership using some aspect of the CBT model such as the skills, think-feel-do cycles, and language
Location observation took place	Location where observation took place
Car	Observation took place in the car
Classroom at Roca	Observation took place in a classroom at the Roca building
I_Place of employment	Observation took place at youths place of employment
Office space at Roca	Observation took place in a office space at the Roca building
Open space at Roca	Observation took place in an open space at the Roca building
Outdoor public space	Observation took place in an outdoor public space such as on the street, at a street corner, park
Public or community building	Observation took place in a public or community building such as library, fast food restaurant, etc.
Residence	Observation took place at a residence including porch, lawn, and driveway
Mode of Administration	How CBT is presented to Roca youth
I_Skill visuals on wall	CBT administered using the skill visuals on the wall in the Roca building
Informal conversation	CBT administered during an informal conversation
PowerPoint slides	CBT administered using PowerPoint slides
Skill cards	CBT administered using skill cards
Skills Manual binder	CBT administered using the CBT skills manual binder

Name	Description
White board	CBT administered using a white board
Worksheets	CBT administered using skill worksheets
Possible quotes	Flagging possible quotes
Staff	Observations related to Roca staff members (Youth Worker, Educator, etc.) perceptions of CBT both in general and as it's being implemented at Roca
Buy-in	Staffs acceptance and support of Roca's CBT model including CBT principles, skills, and programming
Competence	Observed indicator of whether staff is competent teaching the CBT curriculum
Confidence	Observed indicator whether Staff is confidence in teaching the CBT curriculum
Satisfaction	Staffs satisfaction with Roca's CBT model including CBT principles, skills, and programming
Skill use	Observed Staff use of CBT principles and skills
Staff Training and Coaching	Observed indicator of CBT training and coaching
I_ Youth behavior management	Observed indicator of staff ability to manage youth behavior
Youth	Observations related to Roca participants (youth) perceptions of CBT both in general and as it's being implemented at Roca
Buy-in	Observed whether youth accept and are supportive of Roca's CBT model including CBT principles, skills, and programming
Comfort	Observed indicator of whether youth feel comfortable when learning CBT or applying CBT skills to their own life
Engaged	Observed indicator of whether youth are engaged when learning about Roca's CBT model
Positive attitude	Observed whether youth have a positive attitude towards Roca's CBT model
Readiness	Observed indicator of youth readiness to use CBT skills

Name	Description
Satisfaction	Youth satisfaction with Roca's CBT model including CBT principles, skills, and programming
Uptake of skills	Observed whether youth demonstrate an understanding of CBT and using CBT skills

Appendix C. Additional Tables

Table C.1. Roca Participant CBT Engagement Overall and by Roca Site – Pre-COVID-19 Pandemic

Variable	Overall Mean (SD)/ Percent	Boston Mean (SD)/ Percent	Chelsea Mean (SD)/ Percent	Springfield Mean (SD)/ Percent	Baltimore Mean (SD)/ Percent
<i>Monthly Youth Worker CBT Contacts</i>					
<i>Overall</i>	1.18 (1.33)	1.79 (1.74)	0.61 (0.70)	0.75 (0.75)	1.55 (1.32)
<i>Conversation Only</i>	0.67 (0.93)	1.16 (1.31)	0.28 (0.47)	0.44 (0.55)	0.71 (0.70)
<i>Informal With Visuals</i>	0.44 (0.75)	0.70 (0.97)	0.14 (0.18)	0.20 (0.24)	0.82 (0.98)
<i>Formal</i>	0.16 (0.27)	0.19 (0.30)	0.21 (0.30)	0.13 (0.26)	0.08 (0.16)
<i>Rate of Youth Worker CBT Contacts Over All Youth Worker Contacts</i>	0.21 (0.20)	0.25 (0.24)	0.11 (0.11)	0.12 (0.11)	0.27 (0.17)
<i>Monthly CBT Program Attendance</i>	0.93 (0.98)	0.56 (0.54)	0.67 (0.66)	1.13 (0.98)	1.57 (1.41)
<i>Rate of CBT Programming Over All Programming</i>	0.30 (0.23)	0.25 (0.17)	0.23 (0.21)	0.26 (0.19)	0.54 (0.27)
<i>Combined Monthly CBT Training</i>	2.11 (2.03)	2.36 (2.16)	1.28 (1.22)	1.88 (1.61)	3.12 (2.67)
<i>Rate of Combined CBT Training Over all Youth Worker Contacts and Program Attendance</i>	0.23 (0.17)	0.30 (0.19)	0.23 (0.10)	0.17 (0.12)	0.33 (0.18)
<i>Number of CBT Skills Reviewed</i>	5.75 (2.08)	5.99 (1.92)	5.57 (2.19)	5.84 (2.08)	5.42 (2.17)

Table C.2. Multivariate Regressions of Various Outcomes on Monthly Rate of Youth Worker CBT Engagement¹

Variable	Successful Rate of Youth Worker Contacts Coefficient (SE)	Monthly Program Attendance Coefficient (SE)	Obtaining TEP Coefficient (SE)	Obtaining Unsubsidized Employment Coefficient (SE)	Any Arrest Coefficient (SE)	Any Violent Arrest Coefficient (SE)	Any Conviction Coefficient (SE)	Any Violent Conviction Coefficient (SE)
<i>Monthly CBT Youth Worker Contacts</i>	0.06 (0.01)** *	1.41 (0.22)** *	0.02 (0.01)**	0.00 (0.01)	-0.02 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)

APPENDIX C

Age at Eligibility	0.00 (0.01)	0.24 (0.18)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
Race/Ethnicity²								
<i>White, Non-Hispanic</i>	-0.12 (0.1)	1.74 (3.36)	-0.17 (0.09)	-0.04 (0.07)	-0.10 (0.14)	0.02 (0.11)	-0.05 (0.03)	-0.02 (0.01)
<i>Bi/Multi-Racial</i>	0.05 (0.07)	10.48 (7.3)	-0.09 (0.1)	-0.01 (0.07)	0.15 (0.11)	0.11 (0.10)	-0.01 (0.06)	0.04 (0.06)
<i>Other Race, Non-Hispanic</i>	-0.04 (0.09)	-1.42 (2.51)	0.02 (0.11)	-0.08 (0.04)*	-0.14 (0.12)	-0.04 (0.10)	-0.05 (0.03)	-0.01 (0.01)
<i>Hispanic/Latino</i>	-0.06 (0.04)	-1.38 (1.19)	-0.09 (0.05)	0.00 (0.04)	0.02 (0.06)	0.03 (0.05)	-0.01 (0.02)	0.01 (0.01)
<i>Unknown/Not Reported</i>	-0.12 (0.06)*	-0.68 (1.74)	-0.18 (0.05)***	-0.03 (0.05)	0.00 (0.09)	-0.07 (0.06)	-0.09 (0.03)**	-0.03 (0.01)*
Recent Employment	-0.02 (0.03)	-0.02 (1.11)	-0.02 (0.04)	0.05 (0.03)	-0.01 (0.05)	-0.04 (0.04)	0.00 (0.02)	0.00 (0.01)
High School Degree or Equivalent	-0.01 (0.03)	1.00 (0.93)	0.02 (0.03)	-0.02 (0.02)	0.01 (0.04)	-0.03 (0.03)	-0.01 (0.02)	-0.01 (0.01)
Any Significant Trauma	0.09 (0.03)*	0.76 (1.07)	0.03 (0.04)	0.01 (0.03)	0.14 (0.05)**	0.03 (0.04)	0.01 (0.02)	0.01 (0.01)
Parent or Expectant Parent	-0.02 (0.03)	-0.58 (0.94)	-0.08 (0.04)*	0.00 (0.03)	0.05 (0.05)	0.11 (0.04)**	-0.05 (0.02)**	-0.02 (0.01)*
Current Gang Membership	-0.06 (0.03)*	-2.23 (0.87)*	-0.04 (0.04)	-0.04 (0.03)	-0.01 (0.04)	0.00 (0.03)	-0.02 (0.02)	-0.01 (0.01)
Current Drug Use or Sales	0.04 (0.03)	-0.16 (0.88)	0.06 (0.03)	0.03 (0.03)	0.06 (0.04)	0.00 (0.03)	0.00 (0.02)	0.01 (0.01)
Number of Prior Convictions	0.00 (0.00)	-0.17 (0.10)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)
Most Serious Prior Charge is a Felony	-0.01 (0.03)	0.33 (0.81)	-0.04 (0.04)	0.01 (0.02)	0.03 (0.04)	-0.03 (0.03)	-0.02 (0.02)	-0.03 (0.01)*
Prior Arraignment for Violent Offense	-0.04 (0.03)	-0.85 (1.08)	0.05 (0.05)	0.04 (0.03)	0.18 (0.06)**	0.05 (0.04)	0.03 (0.02)	0.02 (0.01)
Prior Arraignment for Weapons Offense	0.02 (0.03)	0.57 (1.01)	-0.02 (0.05)	0.00 (0.03)	0.11 (0.06)*	0.07 (0.04)	0.03 (0.02)	0.01 (0.01)
COVID-19 Overlap³								
<i>Active During COVID-19 Pandemics, but Started Before</i>	0.17 (0.04)** *	4.71 (0.85)** *	0.36 (0.04)***	0.27 (0.03)***	0.02 (0.07)	0.06 (0.06)	0.04 (0.04)	0.04 (0.03)
<i>Started During COVID-19 Pandemic</i>	0.17 (0.05)**	7.34 (1.74)** *	-0.09 (0.04)*	-0.03 (0.03)	-0.33 (0.07)***	-0.07 (0.05)	-0.1 (0.04)**	-0.02 (0.01)
Roca Site⁴								

<i>Baltimore</i>	-0.40 (0.05)** *	-3.27 (1.41)*	0.01 (0.06)	-0.08 (0.05)	-0.02 (0.08)	-0.09 (0.06)	0.00 (0.03)	-0.01 (0.01)
<i>Boston</i>	-0.29 (0.05)** *	-3.86 (1.37)**	-0.11 (0.05)*	0.05 (0.05)	0.13 (0.08)	0.07 (0.06)	0.03 (0.03)	-0.01 (0.01)
<i>Springfield</i>	-0.14 (0.04)** *	4.54 (1.29)** *	0.25 (0.05)** *	0.02 (0.04)	-0.01 (0.07)	-0.06 (0.05)	-0.01 (0.02)	-0.02 (0.02)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

²Reference Category: Black, non-Hispanic.

³Reference Category: No Overlap with COVID-19 Pandemic.

⁴Reference Category: Chelsea.

Table C.3. Multivariate Regressions of Various Outcomes on Monthly Rate of CBT Program Attendance¹

Variable	Successful Rate of Youth Worker Contacts Coefficient (SE)	Monthly Program Attendance Coefficient (SE)	Obtaining TEP Coefficient (SE)	Obtaining Unsubsidized Employment Coefficient (SE)	Any Arrest Coefficient (SE)	Any Violent Arrest Coefficient (SE)	Any Conviction Coefficient (SE)	Any Violent Conviction Coefficient (SE)
Monthly CBT Program Attendance	0.09 (0.01)** *	2.72 (0.36)** *	0.03 (0.01)**	-0.02 (0.01)*	-0.03 (0.01)*	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
Age at Eligibility	0.01 (0.01)	0.29 (0.17)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
Race/Ethnicity²								
<i>White, Non-Hispanic</i>	-0.2 (0.08)*	-0.67 (2.41)	-0.20 (0.08)*	-0.02 (0.08)	-0.07 (0.14)	0.03 (0.11)	-0.04 (0.03)	-0.02 (0.01)
<i>Bi/Multi-Racial</i>	-0.01 (0.07)	8.75 (6.83)	-0.11 (0.10)	0.00 (0.07)	0.17 (0.11)	0.11 (0.10)	-0.01 (0.06)	0.05 (0.06)
<i>Other Race, Non-Hispanic</i>	-0.06 (0.1)	-1.93 (2.5)	0.01 (0.12)	-0.08 (0.04)	-0.13 (0.13)	-0.04 (0.10)	-0.05 (0.03)	-0.01 (0.01)
<i>Hispanic/Latino</i>	-0.07 (0.04)	-1.73 (1.13)	-0.10 (0.05)*	0.01 (0.04)	0.02 (0.06)	0.03 (0.05)	-0.01 (0.02)	0.01 (0.01)
<i>Unknown/Not Reported</i>	-0.12 (0.06)*	-0.77 (1.57)	-0.18 (0.05)** *	-0.02 (0.05)	0.00 (0.09)	-0.07 (0.06)	-0.09 (0.03)**	-0.03 (0.01)*
Recent Employment	-0.01 (0.03)	0.24 (1.04)	-0.01 (0.04)	0.05 (0.03)	-0.01 (0.05)	-0.04 (0.04)	0.00 (0.02)	0.00 (0.01)

High School Degree or Equivalent	-0.02 (0.02)	0.75 (0.86)	0.02 (0.03)	-0.02 (0.02)	0.01 (0.04)	-0.03 (0.03)	-0.01 (0.02)	-0.01 (0.01)
Any Significant Trauma	0.08 (0.03)**	0.57 (0.97)	0.03 (0.04)	0.02 (0.03)	0.14 (0.05)**	0.03 (0.04)	0.01 (0.02)	0.01 (0.01)
Parent or Expectant Parent	-0.01 (0.03)	-0.48 (0.94)	-0.07 (0.04)	0.00 (0.03)	0.05 (0.05)	0.11 (0.04)**	-0.05 (0.02)**	-0.02 (0.01)*
Current Gang Membership	-0.06 (0.03)*	-2.16 (0.85)*	-0.04 (0.04)	-0.04 (0.03)	-0.01 (0.04)	0.00 (0.03)	-0.02 (0.02)	-0.01 (0.01)
Current Drug Use or Sales	0.05 (0.03)	0.03 (0.82)	0.06 (0.03)	0.03 (0.03)	0.06 (0.04)	0.00 (0.03)	0.00 (0.02)	0.01 (0.01)
Number of Prior Convictions	0.00 (0.00)	-0.15 (0.09)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)
Most Serious Prior Charge is a Felony	0.00 (0.03)	0.82 (0.76)	-0.04 (0.04)	0.01 (0.02)	0.02 (0.04)	-0.03 (0.03)	-0.02 (0.02)	-0.03 (0.01)*
Prior Arraignment for Violent Offense	-0.01 (0.03)	0.00 (0.98)	0.06 (0.05)	0.04 (0.03)	0.17 (0.06)**	0.04 (0.04)	0.03 (0.02)	0.01 (0.01)
Prior Arraignment for Weapons Offense	-0.01 (0.03)	-0.22 (0.9)	-0.03 (0.05)	0.00 (0.03)	0.12 (0.06)*	0.08 (0.04)	0.03 (0.02)	0.01 (0.01)
COVID-19 Overlap³								
<i>Active During COVID-19 Pandemics, but Started Before</i>	0.12 (0.04)**	3.37 (0.74)** *	0.34 (0.04)** *	0.28 (0.03)** *	0.04 (0.07)	0.06 (0.06)	0.04 (0.04)	0.04 (0.03)
<i>Started During COVID-19 Pandemic</i>	0.12 (0.05)*	5.83 (1.53)** *	-0.11 (0.04)*	-0.02 (0.02)	-0.32 (0.07)** *	-0.06 (0.05)	-0.10 (0.04)**	-0.02 (0.01)
Roca Site⁴								
<i>Baltimore</i>	-0.41 (0.05)** *	-3.74 (1.34)**	0.01 (0.06)	-0.07 (0.05)	-0.02 (0.08)	-0.09 (0.06)	0.00 (0.03)	-0.01 (0.01)
<i>Boston</i>	-0.14 (0.05)**	-0.31 (1.23)	-0.05 (0.05)	0.06 (0.05)	0.09 (0.07)	0.05 (0.06)	0.03 (0.03)	-0.01 (0.01)
<i>Springfield</i>	-0.18 (0.04)** *	3.5 (1.14)**	0.24 (0.05)** *	0.03 (0.04)	0.00 (0.07)	-0.05 (0.05)	-0.01 (0.02)	-0.02 (0.02)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

²Reference Category: Black, non-Hispanic.

³Reference Category: No Overlap with COVID-19 Pandemic.

⁴Reference Category: Chelsea.

Table C.4. Multivariate Regressions of Various Outcomes on Number of Different CBT Skills Reviewed¹

Variable	Successful Rate of	Monthly Program Attendance	Obtaining TEP Coefficient (SE)	Obtaining Unsubsidized	Any Arrest Coefficient (SE)	Any Violent Arrest	Any Conviction	Any Violent Conviction
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	Youth Worker Contact Coefficient (SE)	nce Coefficient (SE)		Employment Coefficient (SE)		Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Number of Different CBT Skills Reviewed	0.07 (0.00)***	1.67 (0.16)***	0.04 (0.01)***	0.01 (0.00)*	0.01 (0.01)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)
Age at Eligibility	0.01 (0.01)	0.31 (0.17)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
Race/Ethnicity²								
<i>White, Non-Hispanic</i>	-0.17 (0.07)*	0.72 (2.85)	-0.20 (0.08)*	-0.05 (0.07)	-0.11 (0.14)	0.02 (0.10)	-0.05 (0.03)	-0.02 (0.01)
<i>Bi/Multi-Racial</i>	-0.01 (0.07)	9.22 (7.03)	-0.12 (0.10)	-0.02 (0.08)	0.15 (0.11)	0.11 (0.10)	-0.01 (0.06)	0.05 (0.06)
<i>Other Race, Non-Hispanic</i>	-0.04 (0.08)	-1.30 (2.38)	0.03 (0.11)	-0.08 (0.04)*	-0.13 (0.13)	-0.04 (0.10)	-0.05 (0.03)	-0.01 (0.01)
<i>Hispanic/Latino</i>	-0.08 (0.04)*	-1.70 (1.10)	-0.10 (0.05)*	0.00 (0.04)	0.01 (0.06)	0.02 (0.05)	-0.01 (0.02)	0.01 (0.01)
<i>Unknown/Not Reported</i>	-0.05 (0.05)	0.95 (1.64)	-0.14 (0.05)**	-0.02 (0.05)	0.00 (0.09)	-0.07 (0.06)	-0.08 (0.03)**	-0.03 (0.02)*
Recent Employment	-0.04 (0.03)	-0.29 (1.04)	-0.03 (0.04)	0.04 (0.03)	-0.02 (0.05)	-0.04 (0.04)	-0.01 (0.02)	0.00 (0.01)
High School Degree or Equivalent	-0.01 (0.02)	1.16 (0.89)	0.02 (0.03)	-0.02 (0.02)	0.01 (0.04)	-0.03 (0.03)	-0.01 (0.02)	-0.01 (0.01)
Any Significant Trauma	0.04 (0.03)	-0.31 (0.98)	0.00 (0.04)	0.01 (0.03)	0.14 (0.05)**	0.03 (0.04)	0.00 (0.02)	0.01 (0.01)
Parent or Expectant Parent	0.00 (0.02)	-0.14 (0.90)	-0.07 (0.04)*	0.00 (0.03)	0.04 (0.05)	0.00 (0.04)**	-0.05 (0.02)**	-0.02 (0.01)*
Current Gang Membership	-0.03 (0.02)	-1.50 (0.84)	-0.02 (0.03)	-0.03 (0.03)	0.00 (0.04)	0.00 (0.03)	-0.02 (0.02)	-0.01 (0.01)
Current Drug Use or Sales	0.03 (0.02)	-0.40 (0.83)	0.05 (0.03)	0.03 (0.03)	0.06 (0.04)	0.00 (0.03)	0.00 (0.02)	0.01 (0.01)
Number of Prior Convictions	0.00 (0.00)	-0.19 (0.09)*	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)
Most Serious Prior Charge is a Felony	0.00 (0.02)	0.75 (0.77)	-0.03 (0.03)	0.01 (0.02)	0.03 (0.04)	-0.03 (0.03)	-0.02 (0.02)	-0.03 (0.01)*
Prior Arraignment for Violent Offense	-0.01 (0.03)	-0.12 (0.98)	0.06 (0.05)	0.05 (0.03)	0.18 (0.06)**	0.05 (0.04)	0.03 (0.02)	0.01 (0.01)
Prior Arraignment for Weapons Offense	0.01 (0.03)	0.38 (0.95)	-0.03 (0.04)	0.00 (0.03)	0.11 (0.06)*	0.07 (0.04)	0.03 (0.02)	0.01 (0.01)
COVID-19 Overlap³								
<i>Active During COVID-19 Pandemics, but Started Before</i>	0.06 (0.04)	2.39 (0.81)**	0.31 (0.04)***	0.26 (0.03)***	0.02 (0.07)	0.05 (0.06)	0.03 (0.04)	0.04 (0.03)

<i>Started During COVID-19 Pandemic</i>	0.15 (0.04)***	7.06 (1.63)***	-0.11 (0.04)*	-0.04 (0.03)	-0.34 (0.07)***	-0.07 (0.05)	-0.10 (0.04)**	-0.02 (0.01)
Roca Site⁴								
<i>Baltimore</i>	-0.37 (0.04)***	-2.51 (1.26)*	0.02 (0.06)	-0.08 (0.05)	-0.04 (0.08)	-0.09 (0.06)	0.00 (0.03)	-0.01 (0.01)
<i>Boston</i>	-0.21 (0.04)***	-1.89 (1.24)	-0.08 (0.05)	0.05 (0.05)	0.09 (0.07)	0.05 (0.06)	0.02 (0.03)	-0.01 (0.01)
<i>Springfield</i>	-0.15 (0.03)***	4.3 (1.16)***	0.24 (0.05)***	0.02 (0.04)	-0.01 (0.07)	-0.06 (0.05)	-0.01 (0.02)	-0.02 (0.02)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days.

²Reference Category: Black, non-Hispanic.

³Reference Category: No Overlap with COVID-19 Pandemic.

⁴Reference Category: Chelsea.

Table C.5. Multivariate Regressions of Various Outcomes on Monthly Rate of Youth Worker CBT Engagement, Monthly Rate of CBT Program Attendance, and Number of Different CBT Skills Reviewed Interacted with Age, Employment, Education, Trauma, Parent Status, Gang Membership, and Drug Use¹

CBT Variable	Interaction Variable	Successful Rate of Youth Worker Contacts Coefficient (SE)	Monthly Program Attendance Coefficient (SE)	Obtaining TEP Coefficient (SE)	Obtaining Unsubsidized Employment Coefficient (SE)	Any Arrest Coefficient (SE)	Any Violent Arrest Coefficient (SE)	Any Conviction Coefficient (SE)	Any Violent Conviction Coefficient (SE)
Monthly Rate of Youth Worker CBT Engagement	Age	0.00 (0.00)	-0.03 (0.07)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Employment	-0.01 (0.01)	-0.52 (0.53)	-0.01 (0.02)	0.01 (0.02)	0.00 (0.02)	0.02 (0.02)	0.0 (0.01)	0.0 (0.00)
	Education	0.00 (0.01)	0.47 (0.41)	0.01 (0.02)	-0.01 (0.01)	0.02 (0.02)	0.01 (0.02)	0.01 (0.01)	0.01 (0.0)
	Trauma	-0.03 (0.01)*	0.43 (0.45)	0.03 (0.01)*	-0.02 (0.02)	0.00 (0.02)	0.00 (0.02)	0.01 (0.01)	0.00 (0.00)
	Parent Status	-0.02 (0.01)	-0.47 (0.38)	-0.02 (0.02)	0.00 (0.01)	-0.01 (0.02)	0.01 (0.02)	-0.01 (0.01)	0.00 (0.00)
	Gang Membership	-0.02 (0.01)	-0.97 (0.49)*	-0.02 (0.02)	0.01 (0.01)	0.01 (0.02)	0.02 (0.02)	-0.01 (0.01)	0.00 (0.00)
	Drug Use	-0.02 (0.01)	-0.72 (0.46)	0.02 (0.01)	0.03 (0.01)**	0.01 (0.02)	0.01 (0.02)	0.00 (0.01)	0.00 (0.00)

Monthly Rate of CBT Program Attendance	Age	-0.01 (0.00)*	0.14 (0.21)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Employment	0.00 (0.02)	0.35 (1.10)	0.00 (0.03)	-0.02 (0.02)	0.05 (0.03)	0.03 (0.03)	0.03 (0.01)	0.00 (0.01)
	Education	0.00 (0.01)	1.55 (0.74)*	0.01 (0.02)	-0.01 (0.01)	0.03 (0.02)	0.01 (0.02)	0.01 (0.01)	0.00 (0.00)
	Trauma	-0.08 (0.02)** *	-1.80 (1.17)	0.01 (0.02)	-0.02 (0.02)	0.00 (0.03)	0.01 (0.02)	0.00 (0.01)	0.00 (0.01)
	Parent Status	-0.03 (0.01)	-1.48 (0.79)	-0.04 (0.02)*	0.00 (0.01)	-0.01 (0.02)	0.00 (0.02)	0.00 (0.01)	0.00 (0.00)
	Gang Membership	0.01 (0.02)	-0.95 (0.81)	0.01 (0.02)	-0.01 (0.01)	-0.02 (0.02)	-0.01 (0.02)	0.02 (0.01)	0.01 (0.01)
	Drug Use	-0.02 (0.02)	-1.25 (0.81)	0.00 (0.02)	0.01 (0.01)	-0.01 (0.02)	0.00 (0.02)	0.02 (0.01)*	0.01 (0.01)
Number of Different CBT Skills Reviewed	Age	0.00 (0.00)	0.14 (0.07)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Employment	-0.02 (0.01)	-0.05 (0.36)	-0.01 (0.01)	0.01 (0.01)	-0.01 (0.02)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)
	Education	0.00 (0.01)	0.30 (0.29)	0.00 (0.01)	-0.01 (0.01)	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.00)
	Trauma	-0.02 (0.01)	0.41 (0.32)	0.00 (0.01)	-0.02 (0.01)	-0.01 (0.02)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.00)
	Parent Status	-0.01 (0.01)	0.07 (0.38)	-0.03 (0.01)**	0.01 (0.01)	-0.01 (0.02)	0.03 (0.01)*	0.00 (0.01)	0.01 (0.00)
	Gang Membership	-0.01 (0.01)	-0.41 (0.35)	0.00 (0.01)	-0.01 (0.01)	0.00 (0.02)	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
	Drug Use	-0.01 (0.01)	-0.35 (0.31)	0.03 (0.01)*	0.02 (0.01)*	0.00 (0.02)	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)

* p<.05, ** p<.01, *** p<.001

¹All models are ordinary least squares models and all are run with robust standard errors. Dichotomous outcomes control for a measure of time at risk after 90 days. All models control for variables discussed in text.

Table C.6. Sample Before and After Matching and L1 Statistics – High Youth Worker CBT¹

Variable and Value	Before Matching (N=524)				After Matching (N=223)						L1 Statistic
	Treatment (N=177)		Comparison (N=347)		Treatment (N=89)			Comparison (N=134)			
	Number	Percent	Number	Percent	Number	Percent (Unweighted)	Percent (Weighted)	Number	Percent (Unweighted)	Percent (Weighted)	
Started During COVID-19 Pandemic	177	20.34%	347	18.16%	89	7.87%	7.87%	134	8.21%	7.87%	6.25E-17

<i>Roca Site</i>											9.02E-17
<i>Baltimore</i>	177	34.46 %	347	35.73 %	89	46.07 %	46.07 %	134	50.75 %	46.07 %	-
<i>Boston</i>	177	33.90 %	347	10.95 %	89	33.71 %	33.71 %	134	19.40 %	33.71 %	-
<i>Chelsea</i>	177	11.86 %	347	29.39 %	89	12.36 %	12.36 %	134	14.93 %	12.36 %	-
<i>Springfield</i>	177	19.77 %	347	23.92 %	89	7.87%	7.87%	134	14.93 %	7.87%	-
<i>Recently Employed</i>	177	27.12 %	347	24.21 %	89	19.10 %	19.10 %	134	16.42 %	19.10 %	9.71445E-17
<i>High School Degree of Equivalent</i>	177	44.07 %	347	44.09 %	89	48.31 %	48.31 %	134	42.54 %	48.31 %	1.11E-16
<i>Caused Physical Harm to Others</i>	177	10.73 %	347	7.78 %	89	3.37%	3.37%	134	2.99%	3.37%	3.47E-18
<i>Received Counseling Prior to Roca</i>	177	28.81 %	347	35.16 %	89	14.61 %	14.61 %	134	17.91 %	14.61 %	2.78E-17
<i>Current Gang Membership</i>	177	64.41 %	347	66.86 %	89	73.03 %	73.03 %	134	62.69 %	73.03 %	1.39E-16
<i>Parent or Expectant Parent</i>	177	35.03 %	347	25.36 %	89	26.97 %	26.97 %	134	21.64 %	26.97 %	1.11E-16
<i>Age at Eligibility</i>											0.203317
<i>Under 18</i>	177	18.08 %	347	21.33 %	89	8.99%	8.99%	134	11.94 %	8.99%	-
<i>Over 18</i>	177	81.92 %	347	78.67 %	89	91.01 %	91.01 %	134	88.06 %	91.01 %	-
<i>Number of Prior Convictions</i>											0.132986
<i>Less than Five</i>	177	81.36 %	347	87.32 %	89	88.76 %	88.76 %	134	92.54 %	88.76 %	-
<i>More than Five</i>	177	18.64 %	347	12.68 %	89	11.24 %	11.24 %	134	7.46%	11.24 %	-

¹For dichotomous variables, only one variable level is provided. For variables with more than two categories, all levels are provided.

Table C.7. Sample Before and After Matching and L1 Statistics – High CBT Programming¹

	Before Matching (N=524)		After Matching (N=255)	
	Treatment (N=195)	Comparison (N=329)	Treatment (N=105)	Comparison (N=150)

APPENDIX C

Variable and Value	Number	Percent	Number	Percent	Number	Percent (Unweighted)	Percent (Weighted)	Number	Percent (Unweighted)	Percent (Weighted)	L1 Statistic
Started During COVID-19 Pandemic	195	23.08%	329	16.41%	105	11.43%	11.43%	150	11.33%	11.43%	5.97E-16
Roca Site											4.93E-16
<i>Baltimore</i>	195	42.56%	329	31.00%	105	55.24%	55.24%	150	40.67%	55.24%	-
<i>Boston</i>	195	10.77%	329	23.40%	105	11.43%	11.43%	150	18.67%	11.43%	-
<i>Chelsea</i>	195	22.56%	329	24.01%	105	19.05%	19.05%	150	20.00%	19.05%	-
<i>Springfield</i>	195	24.10%	329	21.58%	105	14.29%	14.29%	150	20.67%	14.29%	-
Recently Employed	195	28.72%	329	23.10%	105	15.24%	15.24%	150	15.33%	15.24%	5.27E-16
High School Degree or Equivalent	195	44.10%	329	44.07%	105	39.05%	39.05%	150	37.33%	39.05%	5.27E-16
Caused Physical Harm to Others	195	14.87%	329	5.17%	105	0.00%	100.00%	150	0.00%	100.00%	0
Received Counseling Prior to Roca	195	28.21%	329	35.87%	105	22.86%	22.86%	150	18.67%	22.86%	5.55E-16
Current Gang Membership	195	65.13%	329	66.57%	105	70.48%	70.48%	150	69.33%	70.48%	5.27E-16
Parent or Expectant Parent	195	32.31%	329	26.44%	105	33.33%	33.33%	150	20.00%	33.33%	5.83E-16
Age at Eligibility											0.119184
<i>Under 18</i>	195	16.41%	329	22.49%	105	9.52%	9.52%	150	12.67%	9.52%	-
<i>Over 18</i>	195	83.59%	329	77.51%	105	90.48%	90.48%	150	87.33%	90.48%	-
Number of Prior Convictions											0.162336
<i>Less than Five</i>	195	88.72%	329	83.28%	105	92.38%	92.38%	150	90.67%	92.38%	-
<i>More than Five</i>	195	11.28%	329	16.72%	105	7.62%	7.62%	150	9.33%	7.62%	-

¹For dichotomous variables, only one variable level is provided. For variables with more than two categories, all levels are provided.

Table C.8. Sample Before and After Matching and L1 Statistics – High CBT Skills¹

Variable and Value	Before Matching (N=524)				After Matching (N=256)						L1 Statistic
	Treatment (N=294)		Comparison (N=230)		Treatment (N=130)			Comparison (N=126)			
	Number	Percent	Number	Percent	Number	Percent (Unweighted)	Percent (Weighted)	Number	Percent (Unweighted)	Percent (Weighted)	
Started During COVID-19 Pandemic	294	14.29%	230	24.78%	130	10.00%	10.00%	126	15.87%	10.00%	1.87E-16
<i>Roca Site</i>											6.94E-17
<i>Baltimore</i>	294	35.71%	230	34.78%	130	50.77%	50.77%	126	34.92%	50.77%	-
<i>Boston</i>	294	18.03%	230	19.57%	130	20.00%	20.00%	126	25.40%	20.00%	-
<i>Chelsea</i>	294	22.79%	230	24.35%	130	16.15%	16.15%	126	20.63%	16.15%	-
<i>Springfield</i>	294	23.47%	230	21.30%	130	13.08%	13.08%	126	19.05%	13.08%	-
Recently Employed	294	29.59%	230	19.57%	130	14.62%	14.62%	126	15.08%	14.62%	2.78E-17
High School Degree of Equivalent	294	43.20%	230	45.22%	130	42.31%	42.31%	126	41.27%	42.31%	1.94E-16
Caused Physical Harm to Others	294	11.56%	230	5.22%	130	0.00%	100.00%	126	0.00%	100.00%	0
Received Counseling Prior to Roca	294	36.39%	230	28.70%	130	20.77%	20.77%	126	17.46%	20.77%	9.71E-17
Current Gang Membership	294	61.22%	230	72.17%	130	75.38%	75.38%	126	74.60%	75.38%	1.25E-16
Parent or Expectant Parent	294	32.31%	230	23.91%	130	27.69%	27.69%	126	15.08%	27.69%	5.55E-17
Age at Eligibility											0.16456
<i>Under 18</i>	294	16.33%	230	25.22%	130	11.54%	11.54%	126	17.46%	11.54%	-
<i>Over 18</i>	294	83.67%	230	74.78%	130	88.46%	88.46%	126	82.54%	88.46%	-
Number of Prior Convictions											0.10641

<i>Less than Five</i>	294	86.39%	230	83.91%	130	91.54%	91.54%	126	89.68%	91.54%	-
<i>More than Five</i>	294	13.61%	230	16.09%	130	8.46%	8.46%	126	10.32%	8.46%	-

¹For dichotomous variables, only one variable level is provided. For variables with more than two categories, all levels are provided.

Table C.9. Sample Before and After Matching and L1 Statistics – High CBT Per Guidelines on At Least One Measure¹

Variable and Value	Before Matching (N=524)				After Matching (N=231)						L1 Statistic
	Treatment (N=153)		Comparison (N=371)		Treatment (N=89)			Comparison (N=142)			
	Number	Percent	Number	Percent	Number	Percent (Unweighted)	Percent (Weighted)	Number	Percent (Unweighted)	Percent (Weighted)	
<i>Started During COVID-19 Pandemic</i>	153	13.73%	371	21.02%	89	6.74%	6.74%	142	7.04%	6.74%	1.87E-16
<i>Roca Site</i>											2.08E-16
<i>Baltimore</i>	153	39.22%	371	33.69%	89	43.82%	43.82%	142	44.37%	43.82%	-
<i>Boston</i>	153	18.30%	371	18.87%	89	20.22%	20.22%	142	21.83%	20.22%	-
<i>Chelsea</i>	153	21.57%	371	24.26%	89	23.60%	23.60%	142	19.72%	23.60%	-
<i>Springfield</i>	153	20.92%	371	23.18%	89	12.36%	12.36%	142	14.08%	12.36%	-
<i>Recently Employed</i>	153	32.68%	371	22.10%	89	21.35%	21.35%	142	18.31%	21.35%	1.11E-16
<i>High School Degree of Equivalent</i>	153	50.98%	371	41.24%	89	48.31%	48.31%	142	45.77%	48.31%	8.33E-17
<i>Caused Physical Harm to Others</i>	153	15.03%	371	6.20%	89	1.12%	1.12%	142	0.70%	1.12%	5.72E-17
<i>Received Counseling Prior to Roca</i>	153	35.95%	371	31.81%	89	24.72%	24.72%	142	21.13%	24.72%	8.33E-17
<i>Current Gang Membership</i>	153	57.52%	371	69.54%	89	64.04%	64.04%	142	73.94%	64.04%	1.11E-16
<i>Parent or Expectant Parent</i>	153	32.03%	371	27.22%	89	26.97%	26.97%	142	19.72%	26.97%	5.55E-17

APPENDIX C

Age at Eligibility											0.11451 8
<i>Under 18</i>	153	17.6 5%	371	21.2 9%	89	17.98 %	17.98 %	142	20.42 %	17.98 %	-
<i>Over 18</i>	153	82.3 5%	371	78.7 1%	89	82.02 %	82.02 %	142	79.58 %	82.02 %	-
Number of Prior Convictions											0.06028 2
<i>Less than Five</i>	153	87.5 8%	371	84.3 7%	89	88.76 %	88.76 %	142	93.66 %	88.76 %	-
<i>More than Five</i>	153	12.4 2%	371	15.6 3%	89	11.24 %	11.24 %	142	6.34% %	11.24 %	-

¹For dichotomous variables, only one variable level is provided. For variables with more than two categories, all levels are provided.